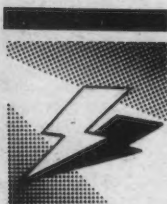


# COMPUTERWORLD

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## A CLOSER LOOK

### System/38 software earns kudos

**T**he unique architecture of IBM's System/38 far exceeds the capabilities of traditional 370-style design, as our April 30 Closer Look noted. Users, Computerworld has found, are also praising the machine's equally unique software characteristics, which they claim offer significant productivity benefits.

By Paul Gillin  
CW Staff

Last year, the data processing department at Minneapolis-based Braden Steel Corp. moved most of its operations from an IBM 370/148 to an IBM System/38. The migration required Braden — now Econotherm Energy Systems Corp. — to scrap its entire software investment, throwing out tens of thousands of dollars worth of packaged software and years of programming effort.

Today, Econotherm DP manager Jack Silver has only one regret. "Our biggest gripe is that we didn't do it soon enough," he said. "I think [the migration] is the best thing we've ever done. Our response time on the System/38 is every bit as good as it was on the 370/148, and we do a lot more with it."

Silver is one of many System/38 users who have found that software development and maintenance is far better on the System/38 than on any other IBM computer. In interviews with *Computerworld*, users and vendors said that, despite incompatibility problems with other IBM programs, the System/38 software is so much better than anything else offered by IBM that it is often worth sacrificing even a major investment in existing 370 software.

"I've never seen anything out there that compares to the [System/38]," said Douglas Donath, vice-president of marketing at Creative Computer Resources, Inc., a Costa Mesa, Calif.-based vendor of System/38 software.

"But it's the best kept secret in the industry. In public, it's pooh-poohed as a minicomputer. But I think it's really a threat to the [IBM] 4300 and even 3080 series machines."

One perpetual problem for the System/38 has been its nebulous classification. Many users say it performs like a mainframe. But it has

See IBM page 4



## Ford says no to Net 1000

### Automaker's decision after six-month trial could damage AT&T system's future market viability

By Bob Wallace  
Special to CW

DEARBORN, Mich. — After a six-month beta test of the network, the nation's second largest automaker has decided against subscribing to AT&T Information Systems' Net 1000.

Ford Motor Co. spokeswoman Linda Lee said, "The evaluation has ended, and we have decided not to buy Net 1000 at this time." Although Ford officials would not comment on why they would not purchase the system, a company source said, "We needed a ubiquitous presence. Net 1000 doesn't have enough nodes."

Analysts who were contacted last week felt the decision by a user of Ford's size could be particularly damaging to the future

of Net 1000.

Tymshare, Inc. spokesman Stan Terra said that the contract to provide a parts locator application had not yet been inked. He explained that Tymshare, Inc. would provide the applications software and mainframe processing, while Tymnet, Inc. would provide the data communications link for the service.

"We are disappointed that [Ford] will not continue with Net 1000," commented Allen Rehert, director of network applications for AT&T Information Systems. "We feel good about what we've done and learned and about what Ford has learned," he said.

"This experience has increased our attention to this industry. We understand a lot

See FORD page 6

## Packaged software, micros, OA spearheading DP budget rise

By Paul Gillin  
CW Staff

NEW YORK — Data processing budgets are on their way up next year at sites supervised by more than a dozen DP managers interviewed here last week. But the increases are less than spectacular, averaging between 5% and 10%, the managers said.

In random interviews at the Information Management Exposition & Conference (Info '84), managers pointed to packaged soft-

ware, microcomputer-related expenses and office automation as their leading cost gainers. But in contrast to prior years, personnel costs seem to be holding steady, they said.

The use of packaged software was seen as spearheading budget increases at several installations. Alan McLean, director of MIS at Catholic Charities in Brooklyn, N.Y., said he hopes for a 10% budget increase, much of which will be spent buying packaged software. See BUDGET page 10

Info '84 coverage continues on page 10.

## TOP OF THE NEWS

**Withdrawal symptoms.** After stumbling upon a freak combination of input codes, three men allegedly stole \$40,000 from an automatic teller machine and were subsequently arrested. Page 2.

**Make mine relevant.** That is what corporate users said about in-house microcomputer training. Page 8.



CW photo by J. Desmond

**DP managers came in droves to polish their acts at Info '84** in New York last week and witnessed a cavalcade of product announcements, seminars and general hoopla. Stories begin on page 10.

**Hewlett-Packard Co. replaced its Model 150 micro with two machines** ing disk system options and communications that provide expanded data exchange with IBM and IBM-compatible micros. Page 115.

## CDC's abandoning IBM-compatible mart stuns users

By Tom Henkel  
CW Staff

Surprise and concern were the sentiments expressed last week by five users of Control Data Corp.'s line of IBM-compatible peripherals after learning that CDC late last month abruptly decided to stop marketing its line of IBM-compatible peripherals to end users.

"We haven't sorted it out entirely," noted Marinelle Thompson, director of the Office Services Division of Contra Costa County in northern California. Most of the disk drives installed at the county's Martinez data center were manufactured by CDC.

"It came as a shock; we had no indication," Thompson said. Her statement reflected what every other user contacted said: While everyone knew that CDC was having problems with its IBM 3380-compatible disk drive, the 33800, CDC gave no

See CDC page 5

## NEWS

# ATM code fluke spurs \$40,000 theft

By John Gallant  
CW Staff

SPRINGFIELD, Mass. — Three local men who, police said, stumbled upon a freak combination of input codes that allowed them to make as many as 250 unrecorded withdrawals in one night, have been arrested and charged with stealing nearly \$40,000 from eight automatic teller machines (ATM) here.

Carrying some \$15,000 in cash stuffed into their pockets, underwear and shoes, Steven Jefferson, 19, and Steven Porter, 22, were arrested on Sept. 24 by Connecticut State Police as they tried to purchase airline tickets to Hawaii at Bradley International Airport in Windsor, Conn. According to Springfield Police Capt. Ernest Stelzer, state police detained the two men, who were carrying no luggage and attempting to purchase the tickets with cash, because they fit the standard profile of airline hijackers.

Stelzer said state police contacted authorities here, who asked that the pair be returned to Springfield because they were wanted on outstanding warrants — Jefferson for possession of marijuana with intent to distribute and Porter for receiving stolen property. Springfield police then called local banks to determine if any had discovered large cash thefts. At about the same time police contacted the Springfield Institution for Savings, a spokesman there said, bank officials were beginning to investigate a nearly \$40,000 loss that

had occurred over the previous weekend.

Stelzer said a police investigation showed that the two men and Robert Arnold, 17, had made some 250 withdrawals in one night using Porter's bank card from eight of the Institution for Savings' 12 IBM-manufactured ATMs. Police then arrested Arnold and confiscated his car, which they believe the teenager purchased with some of the stolen money.

At their arraignment in Springfield District Court, the trio pleaded innocent to one count each of larceny over \$100, Stelzer said. Police also presented the case to a Hampden County grand jury, which, Stelzer said, may shortly hand down indictments against the three men for conspiracy or multiple counts of larceny. Arnold was released on \$10,000 cash bail, while Porter and Jefferson were ordered held at the York Street Jail in Springfield.

Neither police nor bank officials would divulge precisely how the three men pulled off the theft. But Stelzer told *Computerworld* that, during a routine transaction, Porter appeared to have chanced upon a freak flaw in the ATM's security. He apparently discovered an input code that enabled him to make repeated cash transactions that somehow did not register as withdrawals, Stelzer said.

The spokesman told CW last week that the problem did not involve the IBM equipment but was related to a flaw in a third-party ATM software package that had been customized for use by the bank.

# Two face charges in Apple scam

By Kathleen Burton  
CW West Coast Bureau

SAN FRANCISCO — Two Taiwanese businessmen were indicted here last week by a federal grand jury for allegedly importing and selling counterfeit Apple Computer, Inc. Apple II micros and parts, violating U.S. copyright laws.

U.S. Attorney Joseph Russoniello said the indictments are the first on the West Coast to include smuggling as well as criminal copyright infringement in a computer crime case. The only other similar case filed in the U.S. occurred in February in Philadelphia, where six persons and five companies were charged with copyright violation and with smuggling copies of unassembled counterfeit Apple IIs from Taiwan into the U.S.

Teh Yi Huang and Hon Tao Yu were indicted in San Francisco following an undercover investigation begun in October 1983 by U.S. Customs Service agents, Apple Computer and the U.S. Attorney's office in San Jose, Calif.

Yu, who insiders say cooperated with authorities during the investigation, has not been arrested. The sole owner of A-Tek Enterprises, an electronics distribution firm in Cupertino, Calif., Yu was charged with selling a counterfeit Apple microcomputer to undercover agents for \$500 in 1983 and attempting to sell 30 more.

Huang, sole owner of the Data Borgeest Corp., a small electronics warehouse in Cupertino, Calif., was arrested by the U.S. Customs Service and is being held in San Francisco County Jail pending arraignment. He was charged with attempting to sell counterfeit Apple microcomputers to agents and also charged with filing false invoices and customs statements on a 16-carton shipment of circuit boards, which was seized by customs agents last December at the San Francisco International Airport.

The U.S. attorney's office disclosed that it has evidence linking Huang to other computer smuggling activities in Los Angeles, Florida and Philadelphia. If convicted, Huang faces up to \$85,000 in fines and 19 years in prison. Yu could be sentenced to \$80,000 in fines and 17 years in prison.

## New news is good news

Hard as we try to give our readers the most complete information available, some good news and feature stories never reach us.

Are you involved in an unusual application of DP technology in your company? Have you implemented successful cost-cutting strategies? Is something in your DP shop not working as designed? Know any unsung heroes? Heard any hot news about vendors? Are you aware of technol-

ogy or management trends the trade press is overlooking?

If so, we'd like to hear from you. *Computerworld* has established a reader hot line for information regarding items of interest to the computing community. Call us toll free at (800) 343-6474. Ask for Donovan White, assistant managing editor. We can't be everywhere — but our readers are.

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Relevance is the byword when corporate microcomputer trainers set up an in-house course, according to several trainers interviewed recently/8

**CW at Info '84 — The people:** MIS managers need to become better marketers within their departments if they want their services recognized in the company budget, one consultant told attendees... While many companies talk about local-area networks, few have installed or plan to install them... DP managers said measuring productivity is difficult but necessary... Successful computer system contracts between user and vendor are a guide to implementation and not a threat to vendors, an audience here was told... DP managers would like to have better control of everything from typewriter ribbons to mainframe upgrades, according to interviews conducted here... Two users

offered guidelines for creating a data base model and then selling it to management... Computer users will continue to benefit from price/performance gains resulting from technology advances and further use of standards, NCR Corp.'s president said in a keynote address... A combined voice/data system, not a micro, should be on an executive's desk, according to one manager here... The benefits a company gets from information technology spending depends on its strategic position, a recent report suggested/10-15, 22-27

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Apple Computer, Inc.'s Macintosh has been "a hard sell in corporate America," the company's president admitted in a recent speech/28

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A number of solutions to problems in ergonomics were suggested by attendees of the recent World Conference on Ergonomics in Computing Systems/32

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High-technology entrepreneurs seeking financing for their start-up companies are facing tough scrutiny from venture capitalists, a California high-tech lawyer said recently/38

Corporate treasurers using microcomputers linked to minis and mainframes will be able to expand their role over the next five years, the president of a major financial firm said/40

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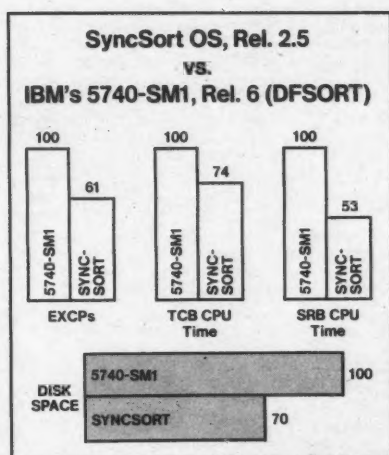
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## NEWS

**IBM** from page 1

generally been pigeonholed as a minicomputer. This is due largely to its small memory size and the fact that IBM's General Systems Division, the minicomputer arm of IBM's previous organization, sold the System/38 for many years.

Until recently, the memory constraint has been an issue. An entry-level System/38 Model 4 can contain as little as 1M byte of memory, most of which is set aside for the operating system. Before IBM's recent announcement of two high-end System/38 models [CW, Sept. 17], the maximum memory on a System/38 Model 8 was 8M bytes, or half the limit on an IBM 4341 Group 2.

**Incompatible with mainframe software**

More importantly, the System/38 is flatly incompatible with all IBM mainframe software. However, the unique systems software characteristics of the machine have convinced many users to accept those limitations as a trade-off for performance and ease of use.

Two years ago, Northeast Wisconsin Technical Institute in Green Bay, Wis., moved from an IBM 370/138 to a System/38, canceling an order for an IBM 4300 series machine in the process.

"We look at it as an even trade," said Dan Van Den Heuvel, the institute's programming section leader. "The System/38 is cheaper, and we can do more work with less bodies now. We would need about one-and-

a-half systems programmers with the 4300. Now I do systems programming myself. Maybe 10% of my time is spent with systems work. Once you get the [System/38] up and running, it pretty much runs by itself."

Not only does the System/38 require fewer programming resources, but its packaged software is cheaper as well. Silver said incompatibility with software written for the IBM 370 architecture was initially a stumbling block when his company moved to the System/38. But he found the savings more than offset the cost.

"We could replace everything we had on the 370 on the System/38 for less than what it cost us to buy the general ledger system on the 370," he said. "You can buy a general ledger for \$5,000 to \$10,000 on the System/38. On the 370, you're talking \$60,000 to \$100,000."

Several unique aspects of the System/38 software are responsible for what users said are major productivity benefits. For one thing, the operating system is on-line, thus eliminating the need for the complex and memory-hungry teleprocessing monitors that are required on IBM's batch-oriented OS and DOS operating systems.

The System/38 also includes a unique user interface called the Control Program Facility (CPF) and its integrated Control Language (CL). CPF offers a consistent interface to all functions. CL is actually a high-level programming language that can be called by RPG-III and Cobol programs.

Because CL can be used to define data description specifications, it eliminates much of the routine and error-prone operations that are usually specified by the programmer.

"In order to get an environment similar to CPF on, say, a 4300, you'd have to put a data base on top and also have CICS there," Donath said. "You'd continually have to add on top to get all those things."

**'CL extremely powerful'**

Van Den Heuvel said, "CL is extremely powerful. You can call it from a high-level program; so, for example, if you want to reroute printer files, you just write it in CL. It doesn't handle files very well, and there's no random access. But it was never designed to be an application language." Van Den Heuvel and others further praised the System/38's Source Entry Utility (SEU), which is used to enter and maintain program source statements.

"SEU has a syntax checker that checks each line for you," Van Den Heuvel said. "It eliminates all those [typographical]-type errors you get. Also, with Control Language in SEU, it gives you prompts. All you have to do is type in the command and prompt it, and it'll show another screen that gives you all the parameters of that command. Basically, all you get is logic errors rather than format errors."

Silver added, "The programming ability on the System/38 is so much easier with the SEU utility. It's much easier to compile and make changes."

The System/38 is also the only IBM data processing system to include an embedded relational data base management system (DBMS). The data base is fully integrated with CPF and includes such attributes as shared files with concurrent update, externally defined data and multiple-access paths. Although data is not stored in a relational form, multiple logical views can be constructed from physical files.

"The System/38 forces you into thinking relationally in the way you define files and subfiles," said Roy Francis, vice-president of research and development at RTC Systems, Inc., a North Attleboro, Mass.-based software vendor. "It also does away with sorting. Instead, you establish a logical view. The data is still in the same structure, but you are using different views."

Van Den Heuvel noted, "It's very

easy to understand how it works. You don't have to go through particular paths to get into a file. It's relatively simple to correct data bases with it."

Because the files are defined externally, coding time is reduced, according to Jack Chenoweth, programming manager at Information Processing Services in Phoenix.

"This way, you don't have to write all the input and output specs," he explained. "You define one file description, and it puts in the I/O parameters for you and lines them up."

Chenoweth further noted that multiple files of the same name can be kept in multiple libraries, allowing for easier backup. "If I need an old file that was backed up a while ago, I can restore it, put it in a different area and point the program at that file," he said.

The subfile feature of the DBMS "will probably save us more time than any other feature," Van Den Heuvel said. "To handle displays where you have to repeat information down the screen in columns, you used to have to [put it into tables.] With subfiles, it can be done as a system function."

**Storage management architecture**

Although the System/38 consumes a lot of memory, its single-level storage management architecture allows programs to be virtually any size. To the System/38, both main memory and disk storage are treated as a single unit. Programs do not have to be paged entirely into memory.

That characteristic can be helpful in a structured programming environment, according to Chenoweth. "The System/38 pages in code, forcing you into structuring," he said. An additional benefit is that "there's not much limit on how big a program can be," he added. "I had one big program run on the System/38 that we couldn't run in less than four programs on the [System/36]."

Finally, the System/38 presents the choice of using RPG-III, Cobol or PL/I programming languages. Although RPG-III has been criticized as being difficult to read and document, it has won fans at many installations.

"I used to think RPG was a dirty word," Silver said. "When we got the System/38, my initial feeling was we'd probably go with Cobol. But RPG-III seems to have combined the best features of RPG-II and Cobol."

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## NEWS

# Users warmly greet IBM System/38 enhancements

Recent IBM hardware and software announcements, aimed at bolstering support of the enigmatic System/38 computer, have been a cause for joy among the System/38's extremely loyal user community.

The announcements included two high-end models of the System/38 [CW, Sept. 17] and operating system

enhancements [CW, July 2]. Among the highlights are a doubling of main memory capacity to a maximum of 16M bytes on the System/38 Model 40, performance improvements of up to 70%, support for IBM 3270-type terminals, the addition of a version of IBM's Graphic Data Display Manager (GDDM) embedded in the operating system and the ability to attach additional communications lines.

The announcements clearly show that the System/38 is here to stay, users said. Combined with IBM's stated intention to phase out its 4321 and 4331 processors, the activity indicates that the System/38 will become the major alternative to the low end of the successful IBM 4300 line.

The new features extend the power of the System/38 "dramatically," said Roy Francis, vice-president of R&D at RTC Systems, Inc. in North Attleboro, Mass.

Francis noted that in terms of transaction processing, "The [System/38] Model 40 easily overlaps the [IBM] 4361 and even the low-end version of the [IBM] 4381."

Of IBM's adding PL/I support, he said, "PL/I is IBM's language, and it has generally been mainframe-oriented," he explained. "By announcing [PL/I support], graphics and 3270 support, IBM is telling users the System/38 is going to be around for a while."

IBM has also taken steps to make

the System/38 more viable as a data processing machine. The technical feat of adding 3270 series terminal support and GDDM capabilities, designed for the IBM 370 architecture, required "a whole lot of programming," according to Dan Van Den Heuvel, programming section leader at Northeast Wisconsin Technical Institute in Green Bay, Wis.

"If they can take the graphics package and make it run on the [System/38], it makes me think they can do that with a lot of other software, too," he said. Van Den Heuvel believes IBM is aiming eventually to cover almost the entire 4300 line and that the company "is interested in growing its System/38 user base."

## CDC from page 1

indication that it was considering getting out of the IBM-compatible peripherals business.

In fact, one user maintained, the CDC sales force seemed more shocked by the announcement than the users.

Uncertainty over whether CDC will continue to provide any degree of quality maintenance for its IBM-compatible peripherals and concern over the loss of an alternative to buying products directly from IBM seemed to be the major concerns among users contacted last week.

While most said they felt CDC would still provide adequate support for its IBM-compatible drives, Thompson noted that since some of her 3350-compatible drives have been leased from CDC, she wondered how enthusiastically CDC would support those drives if the county office chose to replace them with products from another vendor. She also said that CDC sales staff have indicated that CDC will probably be willing to sell its currently leased drives at very attractive prices.

While he said the CDC announcement did not please him, Dr. James L. Carmon, director of the Office of Computing and Information Services at the University of Georgia in Athens, Ga., noted, "we can live with it."

"The peripherals division [at CDC] was one of the most profitable divisions. It surely did come as a surprise," he said, expressing regret that there is now one fewer vendor offering IBM-compatible peripherals.

A DP executive with a Pennsylvania bank explained he purchased CDC disk drives for two reasons: CDC was offering a double-density version of IBM's 3350 (IBM was not), and the CDC units were available sooner than IBM could deliver its single-density model. The only good news about the CDC announcement, the executive continued, is that CDC said it plans to stay in the OEM disk drive marketplace.

In the long run, the decision to drop the IBM-compatible peripherals line may work to CDC's advantage, noted Elaine Litman, president of VIM, the CDC users group. She noted that for some time, CDC has been trying to do business in three marketplaces at once — the mainframe business, the IBM-compatible peripherals business and the supercomputer business. She said that CDC off-loaded the heavy research and development costs associated with supercomputers when it spun off its supercomputer development project into a start-up company, ETA Systems, Inc., about a year ago.

Litman noted that since IBM has been much more competitive in the mainframe peripherals market in the past few years, it has become more difficult for CDC and other plug-compatible manufacturers to compete.

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## NEWS

WASHINGTON  
UPDATE

## Computer crime bill handed to Senate, waits acceptance

WASHINGTON, D.C. — The fate of the U.S. House of Representatives' computer crime bill (H.R. 5616), which had languished for two months since the House passed it in July, was in the hands of the U.S. Senate at press time last week as the 98th Congress worked toward adjournment.

Passage of the computer crime legislation hinged on whether the Senate accepted a package of anticrime bills pushed by House Democrats — which includes the computer crime bill H.R. 5616 — or a different anticrime package pushed by Republi-

cans that does not contain the computer crime bill.

Rep. William J. Hughes (D-N.J.), the computer crime bill's sponsor, deftly placed H.R. 5616 in the Democrats' anticrime package Tuesday, which the House passed on a 406:16 vote. If the Senate rejects this package in favor of the Republican version, then the computer crime bill is likely to die when Congress adjourns for election campaigning, and the legislative process must begin again next year.

H.R. 5616 would make it a federal crime to gain unauthorized access to computers used by the federal government or in interstate or foreign commerce [CW, July 30].

## Copyright protection urged to combat software piracy

WASHINGTON, D.C. — The U.S. Copyright Office, in a major study of international copyright issues, said

the U.S. should put copyright protection of computer software high on the agenda of its discussions with multinational copyright organizations and bilateral U.S. trade agreements with Pacific Basin countries.

To combat the international software piracy problem, the U.S. should urge international organizations, whose treaties do not specifically cover software, to begin a study of "whether existing copyright laws and treaties apply to software and whether special amendments might be desirable to balance private and public interests," the report said.

A second strategy, it said, is for U.S. trade negotiators to seek copyright protection in trade agreements with such countries as Singapore and South Korea, which want to attract high-technology investment, but lack copyright protection.

At a recent U.S. Senate hearing on the report, David Ladd, U.S. register of copyrights, noted that Singapore is responding to U.S. pressure for a copyright law there.

## GAO: More computer use can catch welfare cheaters

WASHINGTON, D.C. — State agencies administering federal welfare programs should make more use of computers to match wage data from external sources, such as employers, with the income data reported by welfare recipients, according to Congress' General Accounting Office (GAO).

In a recent report, GAO said some states are conducting these wage matches manually — a time-consuming and inefficient way to catch welfare cheaters — leaving little time for caseworkers to follow up on discrepancies.

Greater use of computers, which Congress envisioned when it required states to conduct wage matches, would increase the speed and accuracy of identifying the large discrepancies that require further investigation, the GAO report indicated.

## Banks attack transaction disclosure proposals, cite DP burdens

WASHINGTON, D.C. — Proposed federal regulations that would require all U.S. banks and their overseas branches to report all foreign transactions have been stalled as a result of fierce opposition from banks that cited the added burden on data processing systems.

The U.S. Department of the Treasury proposed the regulations earlier this year to meet the intent of a recently enacted law designed to crack down on overseas drug traffic.

Attendees of a meeting here last week of the Advisory Committee on International Investment, Technology and Development concerning trans-

border data flow issues were told by U.S. Department of State officials and representatives of the American Bankers Association that the Treasury regulation has been put on hold for the time being.

Robert E. Walker, vice-president and associate general counsel of Continental Bank in Chicago, said U.S. banks are facing a growing dilemma meeting the laws and disclosure regulations of the U.S. while at the same time abiding by the financial privacy laws of foreign countries. Congress specifically exempted foreign financial transactions from existing financial privacy laws.

The West German government has adopted a

policy of asserting that the privacy of an individual's financial transactions accompanies the data if it is transferred to the U.S. for processing, Walker said. "This is making it extremely difficult for transborder data flow to occur easily," he added.

While the privacy issues have been raised by banks in their effort to halt the proposed rules, greater concern over the added processing costs to produce the necessary records to meet the requirements is an equal factor, Walker said. "There are enormous operational costs involved here, and we want the Treasury Department to publicize [its] final rule with an opportunity for comment."

## FORD from page 1

more about this type of application and applications in the automotive industry in general," Rehert explained.

"This relationship has given us a

very strong experience base in distributed processing applications with various types of data in the system," he added.

On Net 1000's processing nodes, Rehert replied, "The customer should not really be concerned by the num-

ber of processing nodes because the 800 [Wats] service basically gives Net 1000 ubiquitous access."

"Ford's decision is a blow to AT&T and comes at a critical time because IBM is in the process of putting its foot down on the accelerator in every

area. AT&T doesn't need any bad news because IBM is on a roll," said Michael Killen, president of Strategic, Inc., which is located in San Jose, Calif.

"The Ford decision may be significant in either altering the scope of the product or ending the product altogether. I would lean toward the latter. I don't think Net 1000 has much of a future," remarked Kim Myhre, manager of communications industry research for International Data Corp., a market research firm in Framingham, Mass. "[Net 1000] was a great idea without a lot of foundation. They really didn't have the resources in place or the potential customer base to sell the product," Myhre said.

"Here's a customer who probably decided that it is too expensive," said Kenneth Bosomworth, president of International Resource Development, Inc. in Norwalk, Conn.

"The product is somewhat confusing," Myhre said. "If Net 1000 is a time-sharing service, then AT&T was starting off in a game in which there are a lot of players with far more established facilities in terms of program development software and accessible locations than it had."

Myhre said that in the time-sharing market, AT&T has no advantage on the competition aside from owning the necessary facilities, which, he maintained, "is really no leg up in the processing services business."

Wallace is a staff writer for Computerworld On Communications.

# DJC

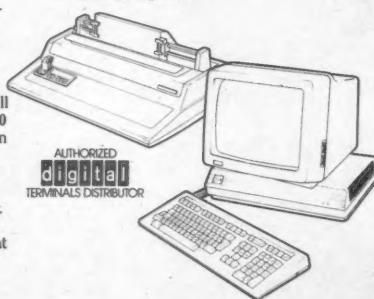
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## NEWS

# DP manager takes thorny problem to users group meet

## Advice to reduce transmission rate may prolong life, postpone upgrade on DG Eclipse

By Jeffery Beeler  
CW West Coast Bureau

SAN DIEGO — Doug Hurt is still unsure whether his idea succeeded or failed.

Without question, he received a number of apparently reasonable suggestions when he attended a recent users group meeting here and enlisted the aid of his fellow conferencegoers to solve a thorny technical problem. But whether any of the proposed solutions will ultimately prove effective remains to be seen.

Hurt works as a programming supervisor for Ethyl Corp.'s Aluminum Group in Baton Rouge, La., which uses several Data General Corp. Eclipse C350 processors for controlling an aluminum extruding process. After five years of use, the C350s are beginning to run out of capacity and will eventually have to be replaced with larger DG machines.

### Postpone the inevitable

But like many other Eclipse users, Hurt and his Ethyl coworkers would like to postpone the inevitable upgrade at least one year, possibly even two, by extending the operational life of their existing equipment.

"We've got a lot of money invested in our machines," Hurt said during a postconference telephone interview, "and we want to use them to the maximum."

So Hurt and his colleagues tried every trick they could think of to squeeze at least a year of additional use out of their current processors.

But despite their efforts, they were unable to achieve the desired results.

Then Hurt had a brainstorm: Surely, he reasoned, Ethyl was not the only user organization to encounter capacity or performance limitations with its C350s. He figured: Why not consult other DG customers, find out how they overcame the same problem and profit from their experiences?

The North American Data General Users Group (Nadgug) meeting gave Hurt an ideal opportunity to put his idea to the test. On a bulletin board that stood just a few feet away from the conference's registration desk, he tacked a handwritten message asking his fellow Nadgug members for advice.

"Is anyone out there trying to get one or two more years out of a C350 before going to M10000?" the note inquired. "If so, I'd like to talk to you about what [you're] doing to stretch your capacity."

### Disappointing response

Although the request for suggestions remained on the bulletin board for more than four days, "It did not bring in quite the response I had hoped for," Hurt said.

Hurt did elicit a number of replies, however, when he asked other conference attendees for advice in person. To his dismay, many of the face-to-face contacts resulted in an unexpected turnabout that cast him in the role of teacher rather than student.

"When I described our problem to other users and explained what we had done to try to solve it, some of them said, 'Wow, we could really

learn something from you,'" he recalled. "That kind of response did a lot for my ego, but it didn't help me much with my problem."

A few of his person-to-person exchanges, however, did lead to some potentially helpful suggestions. Wild Hare Computer Systems, Inc. President Bruce Ray, for example, advised Hurt to ease the burden on his C350s by cutting the bit/sec rate.

At present, Ethyl's Baton Rouge Eclipses communicate with their terminals at 9.6K bit/sec, Hurt said. But if Ray's suggestion is ever adopted, the transmission speed would drop to 4.8K bit/sec.

In theory, the reduced bit/sec rate would be "almost imperceptible to users," but "would give the [C350s] a little time to breathe between characters," according to Ray, whose Boulder, Colo., firm makes enhancer boards for DG's AOS.

Ray's reasoning made sense to Hurt. By halving the speed at which its terminals transmit data, Ethyl could cut the number of times its Eclipses are interrupted to do I/O. The rate reduction would thus increase the amount of time available to the machines to process information, Hurt theorized.

In practice, however, the effective-

ness of Ray's proposed solution is still open to question. "A lot of our programmers have been on vacation recently," Hurt explained during a telephone interview. "So we haven't had a chance yet to find out whether [the reduced bit/sec rate] really works."

At present, Ethyl's C350s reportedly use about 50% of their available resources to respond to transactions from their terminals.

"One of our problems is that in the past we provided so many user Help features to our terminal operators that our CPUs simply became I/O-bound," Hurt said.

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MESSAGE	ID	UCB	LABEL	OPTION	PASS	FILE	NO	RECORDS	LOCATION	LENGTH	RETRIES	ACTION
FATS204	TAPE2	281	987654						1401 FT	4 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1407 FT	6 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1408 FT	13 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1408 FT	17 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1408 FT	21 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1409 FT	26 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1409 FT	30 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1409 FT	34 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1410 FT	38 IN	10	PERM DATA CHECK
FATS204	TAPE2	281	987654						1410 FT	43 IN	10	PERM DATA CHECK

The length of these bad spots would cause unrecoverable data checks and I/O errors during processing.

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MESSAGE	ID	UCB	LABEL	OPTION	PASS	FILE	NO	RECORDS	LOCATION	LENGTH	RETRIES	ACTION
FATS107	TAPE1	280	123456						1 FT	1 FT	01	LABEL WRITTEN
FATS204	TAPE1	280	123456						1 FT	1 FT	01	TEMP DATA CHECK
FATS204	TAPE1	280	123456						2 FT	2 FT	02	TEMP DATA CHECK
FATS204	TAPE1	280	123456						16 FT	16 FT	10	PERM DATA CHECK
FATS204	TAPE1	280	123456						2375 FT	4 IN	10	PERM DATA CHECK
FATS204	TAPE1	280	123456						2375 FT	8 IN	10	PERM DATA CHECK
FATS204	TAPE1	280	123456						2376 FT	13 IN	10	PERM DATA CHECK
FATS204	TAPE1	280	123456						2377 FT			PERM DATA CHECK

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## NEWS

# Make in-house micro training 'relevant'

By Edward Warner  
CW Staff

Ask those responsible for corporate microcomputer hardware and software training what the key ingredient to a successful in-house course is, and the answer is likely to be "relevance."

Relevance, they say, is a major reason why firms teach in-house, rather than use one of the many outside instruction vendors. As Ted Standish, manager of end-user training at the Gillette Co. put it, his students "don't have a lot of time to spend diddling around learning something they can't use."

"The courses offered externally tend to be too simplistic," he said.

In-house training programs are relevant, said Barbara Evensen, manager of Chemical Bank's Office Technology Center (OTC), because the trainers know their firm's business better than outsiders. "If someone came to us and [asked for] a [Lotus Development Corp.] 1-2-3 class for the real estate division next week, we could do that," she said.

Evensen's OTC has, in fact, tailored its 1-2-3 course to the special needs of groups of students from the bank's real estate, branch banking, energy and minerals investments and treasury departments. The course is one of 18 different half-day seminars being offered by the OTC, established by the bank in 1983.

Another key ingredient is class

size, training managers say. Whether by dint of office geography or instructional philosophy, the average class size in those firms interviewed is about 12 students, sometimes



CW photo by E. Warner

Evensen, standing, and Nick Trentalange, DEC software specialist.

working two to a micro. Such an environment, Evensen said, promotes a sense of "high tech, high touch."

The drawback to small class size is that demand for training can be intense. When Evensen sent out fliers announcing the start-up of her firm's micro training program in March 1983, she sent them to 25 of the bank's known personal computer users. She got back 200 responses.

Since then, Evensen noted, her department has trained 5,000 people, and its courses have moved from cramped quarters in an office cubicle to two carpeted classrooms at the bank's New York headquarters. A third classroom seating 20 students, each at a Personal Computer, has also been opened at another New York location.

A similar situation exists at the New York headquarters of American Express Co., where Carol Gorelick, manager of office systems training, reported that her classroom of six IBM Personal Computers is often backlogged with training requests. Although courses there last 3½ hours with one student to a Personal Computer, former students said in a recent survey their biggest complaint was that "they had not gotten to use the Personal Computer as much as they'd hoped to," she noted.

At the New York headquarters of Metropolitan Life Insurance Co., the demand for basic training in microcomputers became so great that last month the course was spun off from the firm's information center to a separate department called Electronic Standards and Training. The information center was getting swamped with training requests from new users and now will just offer software instruction for those with some computer familiarity, said Candice Pamerleau, a senior consultant.

Even smaller firms doing in-house micro training report problems meeting demand. According to Roy Hill, chief systems programmer for Blue Cross-Blue Shield of Michigan, "we're under what's needed" for training the users of the firm's roughly 180 Personal Computers.

To cope with demand, some firms have contracted with outside vendors. Half the courses taught to end users at the New York headquarters of Merrill Lynch Pierce Fenner and Smith are provided by outside vendors, according to Ronnie Marx, project manager for human resources development. Though outside vendors are primarily used to cope with demand, they are sometimes called in when the "in-house staff can't handle the technicality of the course."

## Micro training goes public

NEW YORK — Chemical Bank, which claims to have experienced great success with its 18-class, in-house microcomputer training program, is taking that program public.

Although the program's courses have been open to the public since this spring, the bank last month took the major step of advertising the program in banking trade publications such as *American Banker* and *Computers in Banking* and in the newspaper *Data Training*.

Ads also appeared in New York's local magazine on general interest computing, *Computer Living*, but Evensen said that, initially, her program will likely draw most of its students from other financial organizations. Among those firms that have utilized Chemical Bank's training so far are Security Pacific Bank and Marine Midland Bank, headquartered in California and New York, respectively. Digital Equipment Corp. and *Newsweek* magazine.

### Courses available

Among those courses available from Chemical Bank are three different seminars of increasing depth using the Lotus Development Corp. 1-2-3 spreadsheet and classes in Microsoft Corp.'s Multiplan and Micropro International Corp.'s Wordstar.

Each class lasts half a day, usually has no more than 10 students — one to an IBM Personal Computer or compatible — and can be tailored to the special needs of a firm's particular department, Evensen said.

Once the course is over, students are given a phone number for the program's hot line should questions arise. Many of those who take the courses are new computer users, Evensen noted, and "individualized attention more than anything" is used by the instructor to allay their uneasiness.

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## Trainers: hone teaching skills

A good trainer does not need an MBA to teach microcomputer hardware and software to new users in his corporation — but it doesn't hurt. Of the six firms with whom *Computerworld* spoke recently about their in-house microcomputer training, two of the largest had training staffs populated with holders of MBAs.

All the corporate training managers agreed, though, that an MBA, or even a background as a microcomputer user, does not make a good teacher. Because of that, Carol Gorelick, manager of office systems training for American Express Co., requires that all her new instructors take a class called "Effective Classroom Instruction," offered by an outside vendor. Gorelick and another member of her three-person

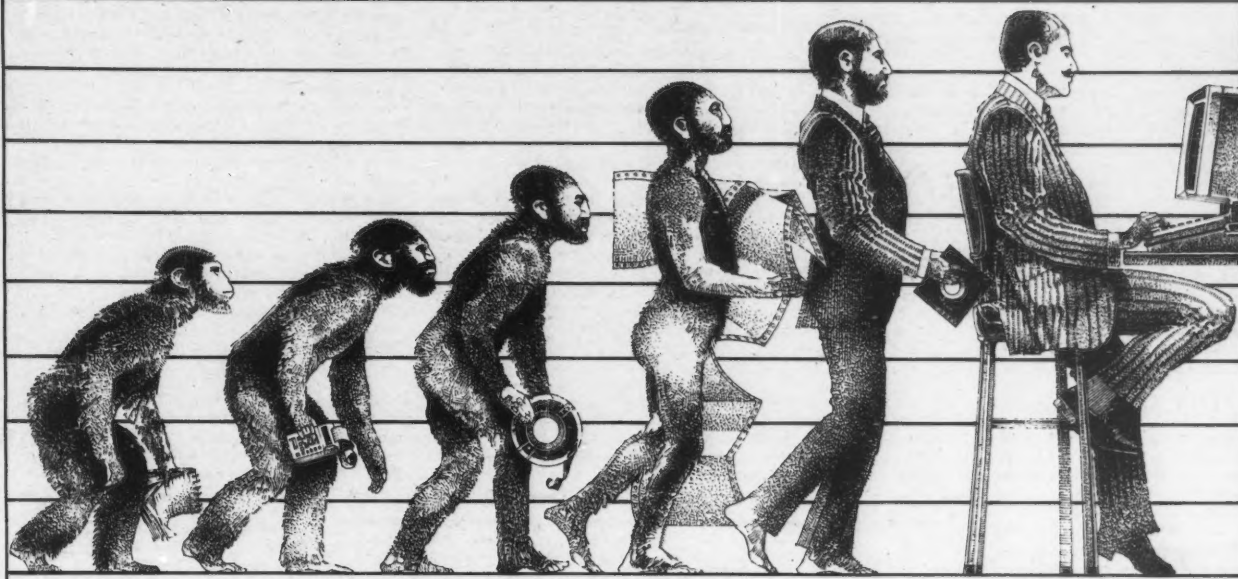
staff both have MBAs.

Another MBA holder, Barbara Evensen, manager of Chemical Bank's Office Technology Center, said she looks for potential trainers who have good interpersonal and communications skills. Those skills are needed, she said, because in the classes, "You're dealing with adults who don't want to make mistakes." At Merrill Lynch Pierce Fenner and Smith's Human Resources Development Department, both microcomputer instructors are former programmer/analysts. And, at Gillette Co., training manager Ted Standish said he favors hiring former users as micro instructors.

"We're primarily looking for teaching backgrounds," he explained. "Teaching is not a trivial part of what we're doing here."



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## NEWS

# MIS credibility hinges on usefulness of product



CW AT  
INFO '84

By Charles Babcock  
CW New York Bureau

NEW YORK — MIS managers need to become better marketers within their own organizations if they want their services to be recognized in the next company budget.

So claimed office communications consultant Alexandra J. Rand, who told an audience at last week's Information Management Exposition & Conference (Info '84) that information service departments generate a host of reports for company divisions without being sure of how the reports are used.

Rand, who operates Internal and External Communication in Santa Monica, Calif., said, "The investment in information services is justified on the grounds that managers are going to make better decisions with the information they receive. If they are not using the reports, then the whole justification is shot down."

MIS departments may not be getting feedback

from the recipients of their reports because "up until now you've had to run hard just to get the product out," she said.

That may not be enough when it comes time to compete for scarce corporate resources, Rand cautioned. There are a number of steps MIS managers can take to put their work and themselves in better positions, she said.

## Adopt formal procedure

The most basic step is to start using some formal procedure to obtain evaluations on MIS reports from major corporate recipients. With an established procedure, the MIS manager will be armed with the kind of feedback he needs to make MIS reports more effective. When the feedback is good, the MIS manager can put an arrow in his quiver for the day when he must answer a critic.

In Rand's Report Rater program, which she authored for users of IBM's Personal Computer, an MIS manager is asked a series of questions about a particular report — listing the data that goes into it, how many people receive it and whether it uses graphics. The program then concocts a standardized questionnaire that is sent to the recipients of the report. It asks such questions as: What percentage of this report do you actually use? Is the

information precise enough? Is it timely?

When a division manager is being allocated a share of MIS expenses based on information he receives, sooner or later he is going to say he is not willing to pay for information that he doesn't use, warned Rand.

The results of the questionnaire can be tabulated into both a summary report and a statistically detailed report. With the feedback, the MIS manager can decide whether to put less information into the report, get the information most in demand into the front of the report or update the information presented.

An MIS staff member can get answers to the questions without investing \$1,995 in the Report Rater program, Rand acknowledged. He can "go into the lunchroom and ask people what they think."

You can only distribute reports on request, then see what is requested. Or send out a memo asking, "Do you like the report and why?" Rand said.

Other things an MIS manager can do to increase the usefulness of his reports include:

- Provide a table of contents.
- Summarize the most important information in a box at the start.
- Move the detail to an appendix.

## BUDGET from page 1

were for the organization's new Data General Corp. MV/4000 minicomputer. He said his software budget will rise about 80% next year, largely due to the new purchases.

"We've been increasing budgets for the last two years with the idea that it will start to decrease in coming years," he said. He added that salary increases will probably be minimal in 1985.

A move to packages was also cited by John Hargraves, manager of DP systems at Travelers Insurance Co.'s applications systems development and office automation department in Old Lyme, Conn.

"We're writing less and less home-grown stuff," he said. A personnel freeze has contributed to his company's commitment to packaged software, he added.

The DP manager at a durable goods manufacturer in Pennsylvania, who asked not to be identified, said he expects packaged software expenses to outpace DP budget growth. "If we can buy it, we do," he said.

Hardware budgets look to be stabilizing, according to the managers interviewed. Wayne Boenkamp, DP manager at Woodward & Dickerson, Inc. in Bryn Mawr, Pa., said he expects his hardware budget to stabilize or decrease next year. "We've pretty much fulfilled our needs inasmuch as everyone has terminals," he said. With several in-house personal computers, Boenkamp said, he is now looking for links to the company's IBM System/38 computer. "We would like to be able to download to spreadsheets and use them to update

our general ledger," he said.

Hardware budgets are also likely to remain flat at Aspen Systems Corp. in Rockville, Md., according to Michael Tansey, DP manager. "Budget controls are pretty tight," he said. However, the overall budget will be going up 15% to 20%, largely due to increases in the programming staff, he said.

Like several managers, Tansey foresaw a continuing explosion in expenditures for microcomputers. "The doors are going to blow off that area," he said. "Fortunately, that's in the users' cost center."

Another manager noted that even though his budget will probably decline more than 10% next year, the section related to micros will increase.

"Microprocessor training and development of micro applications will both increase about 15%," said Paul Peloquin, director of MIS in the consumer products division of Becton Dickinson & Co. in Rochelle Park, N.J. Budget cutbacks will hit hardest in the areas of packaged software, he said. "We were originally planning to bring in several new packages, but we'll now probably stay with what we have," he said.

The director of administrative DP at Columbia University in New York estimated that micro spending in user departments will rise 300% or more in 1985. But Joseph Kroclic said his department's planned 8% to 10% budget growth will be largely due to a mainframe upgrade and the addition of four or five members to the development staff.

Some installations are planning major upgrades next year. TII Corp. in East Northport, N.Y., will probably hike its DP budget by 20% to 25% next year, according to Derek Kirkbride, director of MIS. "We're buying an IBM System/36, personal computers and lots of packaged software," he said.

The DP budget at Thomson & Thomson, Inc. in Boston will rise several hundred percent in 1985, said Charles Lauderman, information systems vice-president. The company is making a commitment to get into image storage and raster scanning as part of its business of searching trademarks, Lauderman said.

## Packaged software was seen as spearheading budget increases at several installations; personnel costs seem to be holding steady.

Expenses for broad areas like applications support and basic information services have stabilized, the manager said. However, pockets like personal computers, office automation, data base support and telecommunications are growing quickly.

With the exception of a few sites that are planning major upgrades,

lize or decrease next year. "We've pretty much fulfilled our needs inasmuch as everyone has terminals," he said. With several in-house personal computers, Boenkamp said, he is now looking for links to the company's IBM System/38 computer. "We would like to be able to download to spreadsheets and use them to update

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## NEWS

## Drawbacks deflating interest in network installation



CW AT

By Paul Korzeniowski  
CW Staff

NEW YORK — Despite the hype and hoopla concerning local-area networks, few companies have currently installed one, nor do they plan to install one in the future.

That observation was furnished by a randomly chosen sample of attendees at the Information Management Exposition & Conference (Info '84) held here last week.

Conference visitors listed a num-

ber of reasons why their companies did not plan to install a local-area network.

Ned Oliver, manager at Towers Perrin Forster & Crosby in Philadelphia noted, "We currently communicate with our mainframe where we can consolidate personal computer data. That capability satisfies our needs."

Limits in what can be local-area network communications capabilities was another reason some companies shy away from network plans. "We need two-way communication between devices," said Marvin Kleinfelter, information systems project leader at Alumax Aluminum Corp. in Lancaster, Pa. "A [local-area net-

work] offers only one-way transfer."

High cost was noted as another network deficiency. "Even large companies find the initial cost hard to bear," noted R. James Mellili of DBA Function Data Processing in Bridgeport, Conn.

Smaller companies can find numerous, cost-effective local-area network alternatives, according to attendees. "It is much cheaper for my company to connect a few dumb terminals to an IBM Personal Computer XT than to buy a [local-area network]," said M. James Caul of Basics, Inc. in Medford, Mass.

Caul added that some companies have installed local-area nets, but do not fully utilize them. "Currently,

networks are not sophisticated enough to meet most companies' requirements," he claimed.

IBM's recent announcement of its PC Network [CW, Aug. 20] did not appear to influence attendees' perceptions of their options concerning local-area network installation.

However, the recent announcement may change one company's local-area network plans. "We were looking at an Ethernet network," Kleinfelter said. "Since we are an IBM shop, we plan to look carefully at the IBM product. But we do not have immediate plans to install a [local-area network]. Our objective calls for at least a two-year wait before installation."

## DP market focus of Oct. 18 meet

IRVINE, Calif. — California Gov. George Deukmejian and retired U.S. Navy Adm. Bobby Inman, chief executive officer of the Microelectronics and Computer Technology Corp. in Austin, Texas, are the keynote speakers at the Irvine Computer Science Conference, to be held Oct. 18 at the University of California here.

The morning session will cover the computer industry in the U.S. In the afternoon, university faculty will discuss subjects such as software engineering and artificial intelligence.

Registration for the program, sponsored by the University of California at Irvine Business and Industrial Associates (UCBIA), is \$60, or \$35 for UCBIA members. More information is available from John Feltman at UCBIA, 555 Administration Building, University of California, Irvine, Calif. 92717.

## DSS conference slated for Oct. 22

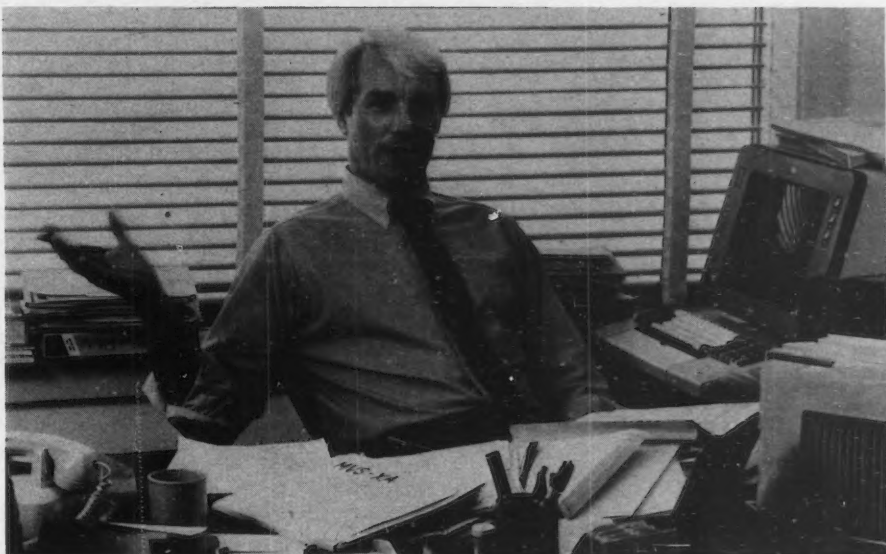
CHICAGO — A conference on software tools for distributed decision support systems (DSS) will be held here Oct. 22 and 23 and in San Francisco Oct. 29 and 30.

The conference will address the management issues, payback opportunities and software tools important for distributed DSS, said a spokesman for Suffolk University of Boston, the conference sponsor. The meeting will examine interfacing micros with mainframes and linking workstations with data sources.

Speakers include Peter Keen of International Technology Services, Inc.; Michael Treacy of the MIT Center for Information Systems Research; and Gary Gulden and Adam Crescenzi, both of Index Systems, Inc. Each conference will reportedly have vendor demonstrations and user panel discussions.

Each seminar costs \$595, including meals, a reception and a copy of the conference text. Information is available from the Software Tools Conference, Suffolk University, Boston, Mass. 02108.

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## NEWS

# Schedules handle tricky task of gauging productivity



By John Desmond  
CW Staff

NEW YORK — Data processing managers measure the productivity of their workers by comparing work done with an implementation schedule, while agreeing generally that measuring productivity is a difficult but necessary task.

That was the consensus reached through random interviews on the conference floor at last week's Information Management Exposition & Conference (Info '84) here.

Leonard E. Stevens, manager of special projects within the Information Services Division of Thomas J. Lipton, Inc. of Englewood Cliffs, N.J., said, "The major thing is to create schedules and expect people to adhere to them." Stevens' company, which makes Lipton tea, Wishbone salad dressing and Good Humor ice cream, does not believe in using lines of code as a productivity measure, he said.

"A line of code is not a good measure," Stevens said. "We're talking there about an individual programmer interpreting specifications. It all depends on whether you're using a very structured method of organizing a program." Lipton operates in a multivendor environment with an IBM 3083 mainframe and some Digital Equipment Corp. VAX-11/780s, Stevens said.

To estimate a schedule of implementation for a job at Lipton, a programming staff member first meets with a manager to discuss the job. "It involves rule of thumb and judgment; it's not hard and fast," Stevens said. Lipton tries to implement new applications 18 to 24 months after they are accepted, and the company continually tries to measure productivi-

ty effectively, Stevens said. "[The measuring method is] a question and a problem," he said.

William P. Caram, MIS Stevens Caram manager for Baker Instruments Corp., a subsidiary of Richardson-Vicks, Inc., uses a double-estimating system to devise implementation schedules. When users request an application, an analyst goes over the requested task to understand exactly what needs to be done, Caram said.

The analyst later sits down with a



CW photos by J. Desmond

how long the job is going to take," he said.

He noted that some programmers spend a lot of time analyzing the problem

in the beginning and are fast coders. Other programmers catch on to a job quickly but are slow coders. Caram said he values the programmers who can relate to end users, no matter how fast they code. "If they're slow, so what? Overall, it'll average out. It's the perception that the user has that's really important," he said.

*Some programmers spend a lot of time analyzing the problem in the beginning and are fast coders. Other programmers catch on to a job quickly but are slow coders. 'If they're slow, so what? Overall, it'll average out. It's the perception that the user has that's really important.'*

— William P. Caram, MIS manager for Baker Instruments Corp.

programmer to produce a rough estimate of implementation time. If the job is feasible, a programmer who will not code the job is asked to estimate the time the coding process would take. Then a programmer assigned to the job is asked to make a similar estimate. Caram thus has two valid estimates of how long the job should take to implement. "I'll be comparing the two" as the job goes along, he said.

Caram takes into account that some programmers overestimate and others underestimate the time required. "Based on the programmer's track record, I'll tell the user exactly

Caram's firm uses an IBM System/38 processor and has an applications backlog of some 70 jobs.

Theodore Marshall, manager of systems analysts at Pennsylvania Bell Telephone Co. in Philadelphia, believes in training an analyst before beginning a major job to enhance productivity. This is the approach the company took recently before developing Accounts Redesign, a data base of 4 million customers for the customer accounts file system. "The size of the system and the complexity of the task must be taken into consideration" when measuring productivity, Marshall said. The tools program-

mers are given is also a productivity factor, he said.

Pennsylvania Bell also uses an implementation schedule in the form of management charts that divide a program into segments by complexity and type of code required. A job schedule is not estimated until the preliminary program design is complete, he added. With this approach, obvious problems are detected in the design phase, and as a result, programmers "can really make some good time when coding," Marshall said.

Pennsylvania Bell does all its programming in Cobol and uses IBM 3081 and 3084 mainframes with the IBM MVS/XA operating system, he said. The DP center at Pennsylvania Bell, which has about 400 programmers, usually brings new applications on-line 18 months after they are accepted, Marshall said.

## Measuring creativity

William J. Voelker, systems project leader in the Systems Services Department at Brooklyn Union Gas Co. of Brooklyn, N.Y., said he finds it very difficult to measure productivity. "How do you measure creativity?" he asked. "The real measure is the work that gets done."

Brooklyn Union Gas uses reference books to help estimate how long a job will take to implement, he said. "It's very difficult to estimate," he said. "One of our long-term objectives is to improve the accuracy of the estimates."

A programmer said that the best way to measure productivity is by the quality of the finished product. Dan Bailey, a data services specialist with Public Service Electric and Gas Co. of Newark, N.J., said he has recently been working on a program that tests advanced utility industry batteries. His manager established a schedule for the job, "and we either do or don't stick to the schedule," he said.

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## IBM consolidates field operations

ARMONK, N.Y. — IBM last week announced the consolidation of field service operations into a new National Service Division to provide service in the U.S. to the company's full product line.

The division will be part of IBM's Information Systems Group and will include the field service offices of the former Field Engineering and Customer Services Divisions.

Charles P. Biggar, IBM vice-president and formerly president of the Field Engineering Division, was named president of the National Service Division. Robert F. Casella, IBM vice-president and formerly president of the Customer Service Division, was named assistant group executive for service with the Information Systems Group.

C. B. Rogers Jr., IBM senior vice-president and group executive of the Information Systems Group, said the changes are intended to meet company goals of providing efficient service.



## NEWS

# Lawyer calls contract key to user-vendor relationship



CW AT  
INFO '84

By John Desmond  
CW Staff

NEW YORK — What is the extent of a vendor's responsibility in getting a system up and running at a user site?

That was the question debated by a lawyer specializing in computer contracts litigation and the president of a computer services firm at last week's Information Management Exposition & Conference (Info '84) here.

Robert A. Weber, president of Computer Maintenance Corp. of Secaucus, N.J., speaking from the vendor's point of view, said, "The customer's live operation is really out of our control. Whether you get your data working is not our problem." Rather, the vendor is only obligated to meet the system specifications, Weber said.

Taking a different view was attorney Richard Raysman of the New York firm of Brown, Raysman & Millstein, who said, "The live operation I view as teamwork between the vendor and user. The vendor knows what the user really needs." Raysman recommended that users withhold the final 20% system payment until the system has been up and running for 30 days.

Weber countered "A customer will always dream up more new things for a programmer [to do], particularly if the programmer is left on-site."

## Bug vs. enhancement

Raysman said final acceptance of a system is often hung up over disagreements about what is a bug and what is an enhancement. "The vendor views everything as an enhancement, and the user views everything as a bug," he said.

The successful contract, Raysman said, is a guide to successful implementation of a system and "not a club held over the vendor's head." Once a user resorts to alleging breach of contract, "the relationship falls apart" between user and vendor, Raysman said.

The chairman of the New York State Bar Association's Computer Law Subcommittee and a former IBM systems engineer, Raysman made several recommendations on what a successful system contract with a vendor should include:

- Users should prepare a structured agreement with a vendor that ties payment to performance, schedules payments on a milestone basis as the system is implemented and includes detailed design specifications. Those specifications should include terminal response time, a factor often overlooked by users, Raysman said.

- "We try to withhold as much payment as possible from the vendor all the way down the line," Raysman said. He recommended that users make an initial down payment of 10% to 20%, pay 20% once the system is tested and accepted off-site, another 20% when the system is tested and accepted on-site, another 20% once the system has been up and running for 30 days and the final 20% when the system has run for 90 days. The

final payment usually represents the vendor's profit, he said.

Weber disagreed, saying vendors should have 85% of their payment once the system is tested and accepted on-site.

"The reason we want to withhold money is so the vendor will maintain an interest," Raysman countered. "You want to retain the vendor's quality personnel in your establishment for as long as possible." Once the user signs off on a system, the vendor will reassign quality staff, he



Weber

told the audience.

- Users should seek a contract clause that guarantees them the right to work closely with the vendor to implement a system. "There are vendors who don't like this," he said, citing the example of a client who set up a desk and telephone in the vendor's office during implementation. "The vendor went crazy," Raysman said.

- The contract should include provisions for progress reports twice monthly and for progress meetings at



Raysman

least once a month. With such a clause, vendor management is "forced to find out what his own people are doing and forced to tell the user what's been going on," Raysman said. If the vendor misrepresents the progress in the written reports, the user has a string of documented evidence that could be used in litigation, he added.

- Users should obtain software source code. "Without the source code, you're extremely vulnerable. You have no option of fixing the software in-house," Raysman said. If the vendor refuses to give up the source code, he said, users should make an arrangement to have the code held in escrow.

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## NEWS

# Lee Data, Microdata share hardware debut spotlight



CW AT  
INFO '84

NEW YORK — At a show nearly void of major hardware announcements, the spotlight at the Information Management Exposition & Conference (Info '84) here last week was shared by Lee Data Corp., with a workstation and two communications controllers, and Microdata Corp., with two additions to its 9000 business minicomputer series.

Lee Data announced the Series/25 voice/data workstation, said to combine telephone features with IBM 3270 terminal emulation. The Series/25 models 2510 and 2520 feature an internal modem offering 300 bit/sec to 1,200 bit/sec transmission speeds, a 9-in. display and telephone functions such as autodial and teleconferencing, the vendor said.

## Asynchronous support

Both models support asynchronous communications. The 2510 reportedly operates as an asynchronous display terminal with a type-writer-style keyboard, and the 2520 can be connected to a Lee Data controller to emulate 3270 displays as well as standard asynchronous communications. The 2520 offers a 3270-style keyboard.

The Models 2510 and 2520 are priced at \$1,295 and \$1,895, respectively. Both are available immediately.

Lee Data also announced two Series 400 system controllers, Models 410 and 420, with enhanced communications abilities. Both models provide 16 asynchronous ports with an IBM 3270 interface and can be upgraded to support 32 ports, Lee Data said. Transmission rates are 9.6K bit/sec, or 7.2K bit/sec in the 3270 mode. Optional speeds up to 56K bit/sec are available.

The Model 410 reportedly emulates the IBM 3274 control unit Models 1C, 21C, 31C and 41C and also allows asynchronous communications through Digital Equipment Corp. VT52, VT100, VT132 and Hewlett-Packard Co. 2624 point-to-point emulations.

The Model 420 allows access to IBM or IBM-compatible hosts. When operating through IBM's Systems Network Architecture, the 420 emulates IBM control unit Models 1A, 21A, 31A and 41A, the vendor said. The 420's asynchronous ports allow communications in DEC VT52, VT100, VT132 and HP 2624 display emulation modes.

The Model 410 is priced at \$14,820 and the 420 at

\$19,520. The controllers are available immediately.

Lee Data also announced a twisted-pair adapter called Quicklink, said to permit data transmission between any Lee Data display and controller using telephone wiring at distances up to 1,000 ft. It can be used with the vendor's Coax Eliminator Models T1 and T8 for longer

distances. Quicklink is priced at \$98 per connector pair.

Lee Data is located at 7075 Flying Cloud Drive, Minneapolis, Minn. 55344.

Microdata announced the 9208 business minicomputer, said to offer twice the processing speed and disk capacity and 50% more main memory than the 9000. The 9208 runs Microdata's Reality op-

erating system and offers up to 6M bytes of main memory and up to 2G bytes of disk storage. It reportedly can support up to 200 terminals simultaneously and allows asynchronous communications using IBM 3270, 2780 and 3780 protocols.

Because much of the operating system is in microcode, which moves certain soft-

ware functions into hardware, Microdata said, system overhead has been reduced.

The 9208, with 2M bytes of main memory, 512M bytes of disk storage, 16 ports, a 300 line/min printer and two terminals, is priced at \$180,000.

Microdata is located at 17481 Red Hill Ave., Irvine, Calif. 92714.

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## NEWS

# From supplies to upgrades, DP managers want control



CW AT  
INFO '84

By Paul Gillin  
CW Staff

NEW YORK — Data processing managers would like to have more control of everything from typewriter

ribbons to mainframe upgrades, according to interviews conducted at the Information Management Exposition & Conference (Info '84) held here last week.

In response to a question about what segment of the DP operation they would most like to control better, managers provided a bouquet of different responses.

Paul Feloquin, director of MIS in the consumer products division of Becton Dickinson & Co. in Rochelle Park, N.J., cited a basic need. "Staffing costs are a problem now," he said. "The corporation is cutting back in general. Justifying the human resource costs of MIS vs. the overall needs of the corpora-

tion [is an issue]."

Another DP manager, who asked to remain anonymous, said, "Administratively, invoicing in a multivendor environment is just terrible. I feel like I've lost control of it."

Another manager echoed the desire to streamline the hardware procurement process. "It would be nice just to

spend \$100,000 on a new machine without having to get approval," said Derek Kirkbride, director of MIS at TII Corp. in East Northport, N.Y. "But that's just not the real world."

## Paper costs

Wayne Boekenkamp, DP manager at Woodward & Dickerson, Inc. in Bryn Mawr, Pa., cited "paper, typewriter ribbons and diskettes" as cost areas in which he would most like to reign. "If you want to break up an IBM System/38, it takes 300 to 400 diskettes at \$8 a throw," he said.

Several managers said they would like to get a better handle on personnel costs. Joseph Krocuk, director of administrative DP at Columbia University in

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*'It would be nice just to spend \$100,000 on a new machine without having to get approval.'*

— Derek Kirkbride, director of MIS at TII Corp.

New York, said, "The area I'm working on is trying to get more productivity out of people. In fact, we just put up a homegrown time reporting system to try to monitor costs on projects," he said.

Productivity is also a concern at Thomson & Thomson, Inc. in Boston, according to Charles Lauderman, vice-president of information systems. "We'd like to get our people costs more under control," he said. "We're hoping to do that when a fourth-generation language has been brought in by farming out more work to the users."

## Use of micros

Not surprisingly, two managers said they would like to have more say in the use of personal computers. "I have some problems with micros," said Alan McLean, director of MIS at Catholic Charities in Brooklyn, N.Y. "Eventually, we're going to have to share information, and ideally, I'd like to have a terminal on every desk. My fear is that the users are going to get so into using their [personal computers] that they're never going to want to give them up."

Another manager, who asked to remain anonymous, added, "There's a certain amount of faddishness to personal computers that we're trying to combat. We're trying to work more with micros and mainframes together right now."

## NEWS



## PRODUCT SPOTLIGHT

## Value-added network carriers provide companies

By John Dix  
CW Staff

The public data network industry is small; according to one source, combined industry revenues total only about \$30 million more than the Federal Aviation Administration's \$200 million annual communications budget. But these data communications services form the core of many large corporate data networks and are used by many others to supplement private-line networks.

Value-added network carriers, as they are often called, include companies like GTE Telenet Communications Corp., Tymnet, Inc. and Uninet, Inc., the three largest providers in the business, respectively.

Other than GTE Telenet, which began serving customers as Telenet Communications Corp. in 1975, most of today's networks were originally built to support clients of time-sharing companies. Uninet, ADP Autonet, Inc. and Compuserve Network Services, Inc. were created following the precedent set by Tymshare, Inc., which separated its network services from its processing services in 1976 when it spun off Tymnet.

Value-added network services have traditionally been for low-speed asynchronous traffic, usually a terminal accessing a remote host data base at 300 to 1,200 bit/sec. The services have evolved slowly, and today some of the carriers offer syn-

chronous support, while many offer 2,400 bit/sec dial-up terminal access in certain cities.

Applications for value-added networks have also evolved, according to Mark Winther, a senior analyst with Link Resources, Inc., a research firm in New York. In his report "Competition in Value-Added Networks," he wrote: "In the early 1980s, 60% of [value-added network] business involved time-sharing and data base access, while the balance came from providing corporations with superior links between their hosts and terminals. In 1984, the reverse is true, and by 1988, 75% of value-added network services will be intracorporate communications."

The attraction of these services stems from the "value added" to the wire, hence the name value-added network. Unlike a naked private or switched line, to which the user has to add his own error detection equipment and management controls, value-added networks are true services, providing network management that ensures high reliability and availability. Additionally, these networks offer protocol conversion, speed matching and exacting error correction techniques, which provide for very low bit error rates.

The real beauty of value-added networks, however, is that the extra value comes cheap (see story page 17). Value-added network rates are insensitive to distance and are far lower than rates for

private lines, Wats and direct-distance dialing. Clint DeGabrielle, vice-president of marketing and field operations for Tymnet, said that in certain applications, he can beat private-line rates by 40% to 50%. Winther said that value-added network users pay only about \$6/hour, whereas Wats users typically pay \$20 to \$25/hour and direct-distance dialers \$25 to \$30/hour.

Another cost-saving advantage of value-added networks is the protocol conversion that many offer.

If the user wants to maintain a synchronous connection with his host, the options are fewer and harder to cost-justify. In general, however, the traffic mix on value-added networks is changing. "Originally, 99% of Tymnet's traffic was asynchronous terminals talking to time-sharing hosts," DeGabrielle noted. "Today, 30% of our traffic is some form of synchronous traffic." DeGabrielle also estimated that 60% of Tymnet traffic is at speeds greater than 1,200 bit/sec.

At least one carrier, RCA Cylis Communications Corp., carries nothing but synchronous traffic. That service is unlike other value-added networks in that it is satellite-based and, because of its target traffic, typically chases a different breed of user.

Traditional carriers like GTE Telenet carry less synchronous traffic than does Tymnet — 5% to

## Corporate use of value-added networks varies dramatically

By John Dix  
CW Staff

Use of value-added networks varies dramatically among large corporations. Some companies are large users, foregoing use of any private lines; others maintain both private-line networks and value-added nets for certain applications, while still others use the networks limitedly or as a stopgap measure.

Tandy Corp. is an example of the foremost category. Tandy relies almost solely on value-added network services to communicate with its 6,500 Radio Shack retail outlets. Ray Durbin, director of Tandy's computer store services, said that the company uses both GTE Telenet Communications Corp. and Tymnet, Inc. to support as many stores as possible with a local call. The others are supported with a direct incoming Wats line.

Each store in the chain has a Radio Shack TRS-90 Model 4 with a 5M-byte hard disk drive and a Radio Shack 300 bit/sec modem. Every day, a connection is established between each store and the company's Tandem Nonstop II computer in Fort Worth, Texas, using the appropriate value-added network. During this session, the store's stock data is updated, daily sales reports are logged in with headquarters, payroll is processed if needed and ordering and inventory information is exchanged.

Other than the economic advantage of value-added networks over direct-distance dialing, Durbin said, the services help insulate the corporate mainframe. "When a store transmits data to us, it goes onto tape for storage; it is spooled and

batched over to the mainframe at night, giving us a little added protection," Durbin said. "There's no chance anyone can break into our computers."

Another company concerned with security decided it could not use value-added networks because they were mutually exclusive with the security technology it was adopting. Jerome Kruzek, manager of data communications for Quaker Oats Co.

with its distributors, Chrysler today uses telex and TWX services to communicate with some of its suppliers. Nobel said that as personal computers are put into these locations, value-added network services would be adopted to support them.

Why use value-added nets when Chrysler has such a large private-line network? Nobel said the distance-insensitive rates, protocol conversion and low bit error rates all

This is an approach being adopted by many companies, according to Audrey Mandela, a senior analyst with the Yankee Group, a market research and consulting firm in Boston. She said that "we'll see a lot more companies develop their own networks along these lines as large corporations begin to see their networks as corporate assets rather than as cost centers."

But this strategy is less appealing to infrequent value-added network users — those who use the service predominantly to supplement private-line networks.

Time, Inc. in Chicago, for example, is not what its data communications manager John Lenzen would call a heavy value-added network customer. "We use Telenet to access some small international offices because the cost of a leased line to those locations would be astronomical," he said.

For Crocker National Bank in San Francisco, value-added nets are used only as a stopgap until the users supported can be accommodated on the company's private-line network.

Garvin Tutt, vice-president of telecommunications and information research and analysis for the bank, said, "We already have a voice network that goes into every office we have in the state of California as well as some of our out-of-state offices, and the users served by GTE Telenet could be on that same network." At the time the terminal support was needed, however, problems with satellite links in the private network necessitated that value-added networks be brought in as a temporary fix, he said.

*'We'll see a lot more companies develop their own networks as large corporations begin to see their networks as corporate assets rather than as cost centers.'*

— Audrey Mandela, senior analyst with the Yankee Group.

in Chicago, said his company is putting in a callback security system that would not dovetail with value-added network services.

Chrysler Corp. in Detroit has a large corporate private network and also uses value-added network services for certain applications. Paul Nobel, manager of telecommunications planning for the company, said that Chrysler primarily uses Tymnet to support roughly 3,000 dealerships across the country.

Today, communications with dealers' terminals operates at 300 bit/sec, but plans call for the terminals to be turned out in favor of personal computers, at which time higher speeds of 1,200 and 2,400 bit/sec will be preferred, Nobel said.

In addition to communications

made these services preferable over use of the corporate network. He also said, however, that the long-term goal of the company is to migrate to a private packet-switched network.

That is an option that some value-added networks encourage. Floyd Trogon, vice-president and general manager of GTE Telenet, said that he expects to see many Fortune 500 companies evolve to private packet networks or what he calls hybrid networks. This would enable a company to build a packet network using GTE Telenet switches, for example, between areas where it has highly concentrated traffic and use GTE Telenet services to supplement that network in sparsely trafficked areas, Trogon said.



## NEWS

# with reliable telecom services at decreased costs

10% less, according to Floyd Trogon, vice-president and general manager of Telenet — while still others carriers do not support it at all. "Generally, we find that if a company has a [Systems Network Architecture] or [Binary Synchronous Communications] application, it can generally justify a leased line," said Clark Woodford, vice-president of telecommunications services for Compuserve Network Services.

In fact, the widespread use of private lines in Fortune 500 corporations typically relegates value-added network use to a supplementary role. Many companies, however, use nothing but value-added networks for their corporate data network needs, and others maintain private-line networks and use value-added networks for certain applications (see story page 16).

On the average though, large companies usually

rely on value-added networks "to complement in-house private-line networks for low-volume locations or for connections to customers or other enterprises where they could not afford to terminate a leased line," according to Dixon Doll, president of the DMW Group, a research and consulting company in Ann Arbor, Mich.

Others concur. "If you were a [General Motors Corp.], you could probably justify private lines to the major cities, but it's the little towns that would be better off dialing in," said George DeSalvo, director of a service for communications users for the Washington, D.C., office of International Data Corp. (IDC), a market research firm.

The de facto industry standard interface used to connect computers and other intelligent devices to value-added networks is X.25, which is recommended by the International Telephone and Tele-

graph Consultative Committee. Although carriers support multiple interfaces, many computer manufacturers are making hardware that is X.25-compatible.

Controls such as the X.25-defined protocol enable value-added networks to operate with low error rates. That control, however, cannot be extended out to dial-up users, a problem that is compounded by the growing use of personal computers to access value-added networks.

To address this problem, some carriers have endorsed the use of the Microcom Network Protocol (MNP). GTE Telenet endorses MNP, according to Trogon, because it provides error correction in the local loop, which is needed to provide end-to-end error correction.

Provision of such protocols and capabilities, us-  
See NET page 19

## Economies stem from technology behind value-added nets

The economies that value-added networks can pass onto users stem from the technology they use. The networks typically consist of switches located in major metropolitan areas that are interconnected with various leased transmission facilities, including a variety of 9,600 and 56K bit/sec private lines, satellite circuits and 1.54M bit/sec digital T1 spans.

They are also typified by their use of packet-switching technology. This provides for efficient use of the carriers' leased transmission facilities

by enabling packets of data — envelopes containing 1,000 bits or less — from several customers to be combined on the same trunk between network nodes. The economies stem from this sharing.

The network nodes that make up the network also act as a point of interface for users. Customers access value-added networks through these switches in one of the three following ways:

■ Users with minimum needs can tap into a value-added network by logging into a local node with a local

telephone call, or at a higher cost, reaching the nearest node through a Wats number. The advantages of this, according to Mark Winther, a senior analyst with Link Resources, Inc., a research firm in New York, is that there are no fixed costs, and charges are based on call duration.

■ Users who depend on the services more than sporadically may want to lease a port at their local node, which will give them a flat monthly access rate and remove the chance of getting a busy signal, which is possible with dial-in access.

■ Users with still greater traffic needs can opt for a dedicated access facility, which combines a leased port with a dedicated line to the user and is intended for customers that have more than one terminal.

On the host side, customers typically attach their computers to a network with dedicated lines and a host interface processor. Software is available for some computers that enables the customer's computer to be attached directly to a value-added net through a leased line and port.

### A SAMPLING OF VALUE-ADDED NETWORKS

	Asynchronous Terminal Connections				Synchronous terminal support	Host Interfaces		Dedicated net access link	Traffic charges	Protocol conversion	No. of areas net is locally accessible
	Dial-in	Wats access	Private ports	Leased ports		Asynchronous	Synchronous				
ADP Aulonet, Inc. 175 Jackson Plaza Ann Arbor, Mich. 48106	110-300 bit/sec. \$3/hr. 1,200-2,400 bit/sec. \$4/hr.	Same as dial-in, plus \$18/hr. surcharge.	\$500 installation; 110-300 bit/sec. \$250/port/mo.; 1,200-2,400 bit/sec. \$275/port/mo.	\$1,000 installation; 110-2,400 bit/sec. \$600/port/mo.	N/A	\$1,000 installation; \$1,800-\$3,000/mo. depending on no. of ports.	X.25 only. Same as asynchronous.	\$1,000 installation.	\$0.3 per 1,000 char.	N/A	300; interconnect to Tymnet and Tymnet for further access.
GTE Telenet Communications Corp. 8229 Boone Blvd. Vienna, Va. 22180	110-1,200 bit/sec. \$6.04-\$13.91/hr. Per-min. charges also available.	\$25.11/hr.	\$500 installation; \$290-\$750/mo. depending on location and type of facilities used.	Same as dedicated host access links.	Can use synchronous host interface for multiple terminal controller support.	\$100 installation; \$350-\$600/mo. depending on ports.	Asynchronous, 3270 BSC, SDLC, X.25, 2780/3780. \$400 installation; \$800-\$1,100/mo. depending on no. of ports.	\$1,000-\$3,000 installation, depending on speed; \$550-\$1,400/mo. depending on speed and protocol.	Dial-in fee covers first 1,500 packets; \$1.70 per 1,000 thereafter.	Asynchronous and synchronous to X.25; asynchronous to synchronous through special application.	350
RCA Communications Network, Inc. 905 Ridge Lake Road Memphis, Tenn. 38119	N/A	N/A	N/A	N/A	3270 BSC, SDLC, Burroughs Corp. Poly/Select, X.25. \$425 installation; \$370-\$450/mo. depending on locations supported.	N/A	Same as terminal types. \$1,000 installation; \$1,300/mo.	Part of monthly charges.	\$8-\$15 per million char., depending on time of day.	N/A	400
Tymnet, Inc. 2710 Orchard Pkwy. San Jose, Calif. 95134	110-2,400 bit/sec. \$2-\$11.25/hr. depending on location and time of day.	Same as dial-in, plus \$18.75/hr. surcharge.	\$500 installation; \$250-\$450/mo. depending on location.	\$500 installation; \$200-\$375/mo. depending on location, plus 115% of leased line supplied by company.	SDLC, 3270 SDLC, 3270 BSC, RJE/Hsp. \$750 installation; \$350/mo./terminal support.	\$300-\$2,000 installation and \$100-\$600/mo. depending on no. of ports; \$300-\$700/mo. interface costs.	Same as terminal types. BSC, X.25 HDLC, X.25 BSC. \$750 installation; \$300-\$600/port/mo.; \$300-\$700/mo. interface.	\$250 installation; \$800-\$1,500/mo. depending on speed.	\$0.1-\$0.05 per 1,000 char., depending on time of day.	Asynchronous to 3270 BSC, SDLC, RJE/Hsp.	500
Uninet, Inc. 10951 Lakeview Ave. Lenexa, Kan. 66219	110-1,200 bit/sec. \$1.10-\$3.50/hr. depending on location and time of day.	\$23/hr.	\$500 installation; \$225-\$425/mo. depending on location.	Same as private ports, but depends on location plus dedicated transmission facility.	On case-by-case basis through BSC packed assemblies/disassemblies.	\$1,000 installation; \$600-\$800/mo. w/3500 per additional 8 ports.	X.25 only. \$500 installation; \$900/mo./port.	\$450 installation; \$275-\$650/mo. for asynchronous and synchronous links up to 1,000 mi. \$0.70/mi. after that.	\$0.1-\$0.05 per 1,000 char. depending on monthly traffic (25,000-250,000 char./mo.).	N/A	332

Given the complexities of service rates, use this chart for rough estimates only.

## NEWS

# IBM, AT&T perceived as dark horses in network race

By John Dix  
CW Staff

Opinions regarding AT&T Information Systems' Net 1000 and IBM's Information Network vary widely. Some would simply classify both services as value-added networks, while others say AT&T's service is a network to interconnect networks, while IBM's net looks like a remote problem-solving service.

The companies themselves are hesitant to pigeonhole their services into any one category. But George De-

Salvo, director of Communications Technology Service for International Data Corp., a Framingham, Mass., research company, said flatly, "IBM's Information Network and AT&T's Net 1000 are value-added networks."

DeSalvo clarifies this by adding, "The networks are not the same as [GTE Telenet Communications Corp.] Telenet, [Tymnet, Inc.] Tymnet or [Uninet, Inc.] Uninet. They either add more value or aim at

a different segment of the traffic."

"AT&T and IBM would have you believe [their networks] are different," agreed Mark Winther, a senior analyst with Link Resources, Inc., a New York research firm. But, he added, "They are [value-added networks] just like everybody else's." Winther also said both companies "have a lot of problems to work out technically... and neither has had a lot of success so far."

If the networks are the same, how do they stack up?

"AT&T has managed to fool around in this area for so long that a lot of [carriers] don't regard them as a serious [competitive] threat — at least for the short term — and I think that might be a valid observation," noted Dixon Doll, president of the DMW Group, a research and consulting firm in Ann Arbor, Mich.

## Customer access main thrust

"IBM has been dabbling in the [value-added network] business through the Information Network for quite a long time, too," Doll explained. "However, its main thrust is to provide access to IBM application software and to provide customers with access to the new office systems, decision support systems and graphics packages."

Doll would not, in fact, put IBM in the same primary market with traditional value-added networks. He does believe, however, that the company will someday enter the market in a much more direct manner.

Another distinguishing feature of IBM's Information Network, according to DeSalvo, is that it is primarily a synchronous network that is more suited to handling high-speed CPU-to-CPU traffic.

He went on to say that AT&T's Net 1000 falls somewhere between the Information Network and value-added networks typified by GTE Telenet Communications Corp.

Throwing some light on the confusion, Allen Rehert, AT&T's director of network applications for Net 1000, said, "Most Fortune 500 companies already have various types of private networks, and probably many of them are already using a number of [value-added networks]. Net 1000 is aimed at interconnecting these networks, particularly for industries that have large interorganizational or intercorporate communications needs."

For example, Rehert said AT&T is looking at automating buyer and seller problems

for many industries. Once these intercorporate hub applications are developed, other users can be added to the network as spokes are connected to the hub of a wheel, he said, forming a large industry-specific network. This would enable a person using a personal computer to log a purchase order with a firm that maintains a sophisticated order-entry system.

## 'Network of networks'

"AT&T's Net 1000 is going to be a network of networks, where it will offer specific

solutions for industry segments such as the financial industry or credit card companies, but it won't be trying to provide one base service for everyone," clarified Audrey Mandela, a senior analyst with the Yankee Group, a Boston research and consulting firm.

Targeting vertical industry segments is a strategy many value-added network-makers will pursue, she said. This will make it harder in the future to distinguish the services of IBM and AT&T from the rest of the pack.



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## NEWS

# Software AG's DBMS for VAX grabs show spotlight



CW AT  
INFO '84

NEW YORK — A microcomputer-mainframe link that is said to offer distributed data base capabilities and a version of a major data base management system (DBMS) for Digital Equipment Corp. VAX-11 users topped the software product announcements at last week's Information Management Exposition & Conference (Info '84).

Software AG of North America, Inc. expanded its base outside the IBM realm by announcing versions of its Adabas DBMS and Natural programming language for the DEC VAX-11 environment under DEC's VMS operating system.

Adabas(VMS) and Natural(VMS) are said to be functionally identical to the IBM versions of the products. Users can migrate applications from either of the two machines to the other with minimal recoding, the company said.

Adabas(VMS) is a transaction-oriented, high-volume DBMS that reportedly features automatic restart and recovery, the ability to restore data after a media failure, transaction processing and deadlock prevention.

Natural(VMS) is a high-level, nonprocedural application development language designed for nontechnical end users. It uses the characteristics of DEC VT100 and VT200 terminals. Its editor is a superset of the DEC EDT full screen editor.

Adabas(VMS) will be available next month, and Natural(VMS) will be available in the first quarter of 1985. The products are being sold as a package for \$50,000.

Software AG also introduced a tool that allows IBM Vsam users to migrate to

Adabas without program conversion.

Each time a Vsam application performs a call, Adabas/Vsam Bridge converts it to an Adabas call transparent to the application.

The bridge is available for IBM OS and DOS installations for \$10,000 for a perpetual lease or for \$4,000 for a yearly lease. Software AG is lo-

cated at 11800 Sunrise Valley Drive, Reston, Va. 22091.

Tesseract Corp. unveiled a microcomputer-mainframe link that is said to allow data bases to be distributed to local personal computers. Called Merlin, the product reportedly allows applications to be designed that combine mainframe and micro processing.

A built-in Link Command Language allows applications to be built and run simultaneously with the communications link.

Merlin runs on the IBM Personal Computer, Personal Computer XT and Personal Computer AT with a minimum of 256K bytes of memory. The product costs \$1,000 per micro.

The mainframe system runs under IBM's OS and DOS and includes an interface to IBM's IMS, Cullinet Software, Inc.'s IDM and Software AG's Adabas.

It sells for \$20,000 to users of Tesseract application software. Tesseract is located on the Fifth Floor, 101 Howard St., San Francisco, Calif. 94105.

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## NET from page 17

ers and analysts agreed, should be considered carefully when evaluating value-added network services. Other criteria that users should examine is area of coverage and types of protocol support offered.

Speculating about the future use of value-added networks, DeSalvo of IDC said that their fate will hinge on where basic telecommunications rates go and how regulations evolve as far as access charges.

"If [Washington is] going to tax private lines to death, it might be a lot cheaper to go with [value-added networks]."

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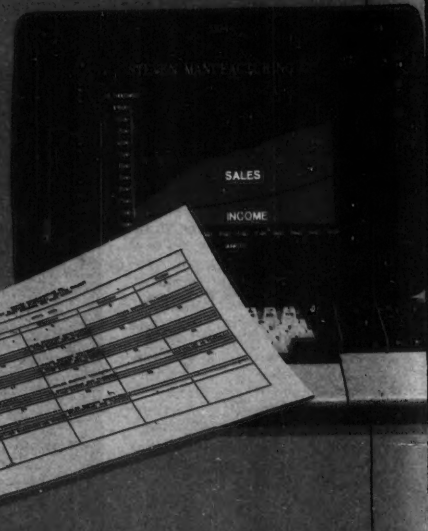
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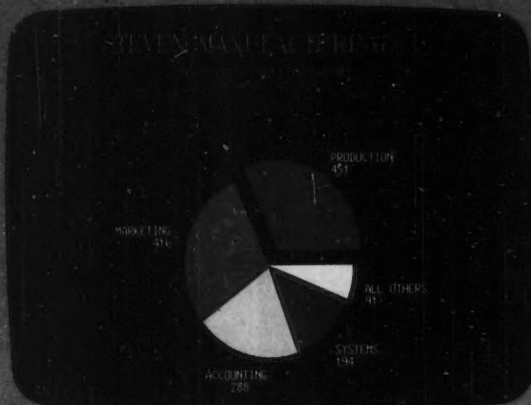
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TABLE 1: SUMMARY OF SAS SYSTEM PERFORMANCE FOR JANUARY 1978

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		EXEC	WAIT	READ	WRITE
ACCOUNTING	ACCOUNTING	12	1.30	10,000	1,000
	ACCOUNTING	15	1.50	12,000	1,200
MARKETING	MARKETING	10	1.10	8,000	800
	MARKETING	12	1.20	9,000	900
PRODUCTION	PRODUCTION	18	1.80	15,000	1,500
	PRODUCTION	20	2.00	17,000	1,700
SYSTEMS	SYSTEMS	14	1.40	11,000	1,100
	SYSTEMS	16	1.60	13,000	1,300
TOTAL	TOTAL	87	8.70	74,000	7,400
	TOTAL	92	9.20	78,000	7,800

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## NEWS

# Creative modeling sells data base to management



CW AT  
INFO '84

NEW YORK — The best way to design your company's data base is to look at how your company does business. Often the data base design will fall naturally out

of that model. You can then take certain tried and true steps to ensure that the transformation to data base technology goes smoothly.

Methods for accomplishing both objectives were outlined here last week by speakers at the Information Management Exposition & Conference (Info '84). At a session on "Strategic Plan-

ning in Data Base Technology," Samuel Whidden, head of information systems development at the American Mathematical Society (AMS) in Providence, R.I., described how his organization had recently used a business model to serve as a foundation for a data base model.

AMS, which is a professional society that also pub-

lishes journals and abstracts, suffered from an applications library that had been developed over a period of almost 20 years. There was little integration, and some of the programs "were patched until it became almost impossible to add more patches," he said. The visible applications backlog at AMS had grown to more than 60 pro-

grammer-years.

AMS management looked at the services the society provided, including publishing, typesetting, subscriber services and meeting management. They found that the various functions shared much of the same data. "We found we could service all functions as if they were on an assembly line," he said.

For example, manuscripts were received, edited, typeset, proofread, returned for final review and ultimately linked together into a journal.

The society found that much of the data that was entered in the process could draw upon or be used by the subscription department and in inventory control or could be employed to create abstracts and indexes.

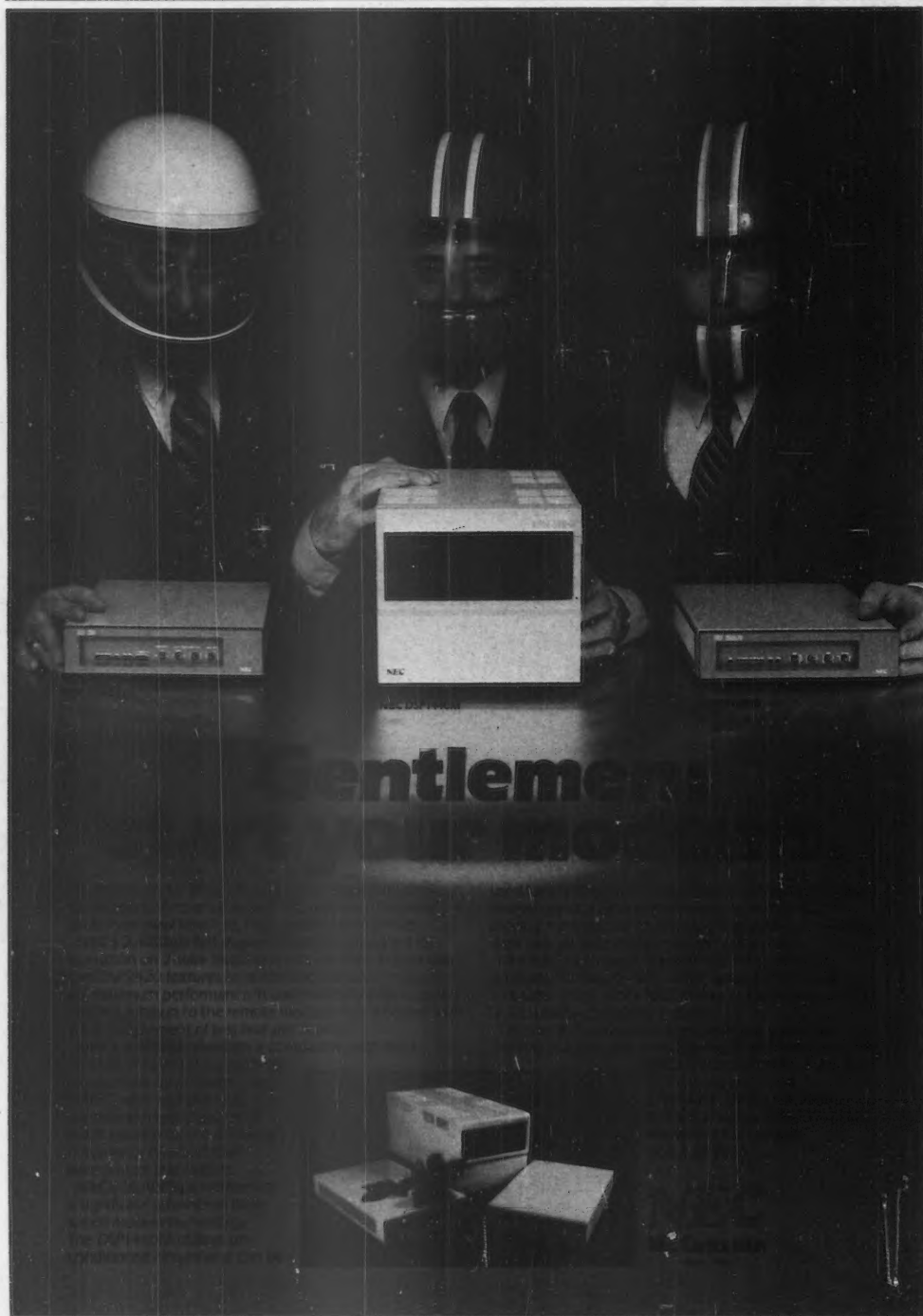
## 'Worth a thousand lines'

From a model that previously had shown only marginal overlap between the various functions, AMS developed a model in which the data base served as a common point for all AMS operations. The model translated very naturally into a data base picture. "It was a picture worth a thousand lines of code," he quipped. The project "aided our efforts to sell a major data base project to top management," Whidden said.

Arlette Klein, vice-president of DP systems at Blue Cross/Blue Shield of greater New York advised a similar approach, but noted that user departments must be fully involved with the process of installing a data base management system (DBMS). "Data base planning requires a commitment at all levels," she said.

That commitment is not difficult to obtain if the DP department can demonstrate tangible results, she said. For that reason, it is best to choose small and visible projects that satisfy an immediate need for data base integration. Get user departments involved in small group planning activities along with representatives from the applications, data base and operations segments of DP, she said.

Milestones should be defined with the users in mind and should be set at reasonable intervals so that users believe progress is being made, she said. Most importantly, the data base should be designed with a long-term view toward expansion and changing requirements. For example, if you are planning to add application generators in the future, you should be aware of the performance problems they cause and should choose your DBMS with performance in mind, Klein noted.





## NEWS

# NCR chief says costs to drop as technology improves



CW AT  
INFO '84

By John Desmond  
CW Staff

NEW YORK — Price/performance improvements will continue to lower the cost per instruction executed and the cost of data storage for years to come, the president of NCR Corp. predicted in a keynote address last week at the Information Management Exposition & Conference (Info '84) here.

Charles E. Exley Jr. of NCR said advances in semiconductor technology, especially metal oxide semiconductors (MOS), along with the continued application of industry standards will yield further gains. "There has been no flattening of cost/performance gains visible as far into the future as we can see," Exley said. "In fact, cost/performance gains are accelerating."

As evidence, he said, the gate speed of MOS microprocessors averaged 100 nsec in 1970, vs. 3 nsec in 1980. The higher speeds have permitted increased complexity. In fewer than 15 years, the industry has moved from 4- to 8- to 16- to 32-bit microprocessors while improving gate speeds, said Exley, who has 30 years of industry experience, with 22 of those years at Burroughs Corp.

#### Reversed relationship

Technology advances have changed the economy of large mainframes and small systems using microprocessors, Exley said. Whereas an old rule of thumb was that "For twice the price one could buy four times the performance," microprocessor technology has reversed the relationship, he said.

Using millions of instructions per second (Mips) rates as a measure, Exley said the cost per mainframe Mips today ranges from \$500,000 to \$1 million, while the cost of supermini Mips ranges from \$150,000 to \$350,000. Further, the cost of 32-bit supermini Mips ranges from \$50,000 to \$100,000, and the cost of personal computer Mips ranges from \$25,000 to \$40,000, Exley said.

Cost/performance advances also result from industry-standard devices such as the Small Computer Systems Interface, which is now available in a single chip. At a cost of less than \$25, this chip replaces an 11- by 14-in. board that costs \$250, Exley said. Such devices have a double-barreled effect on cost — they lower manufacturing cost by reducing component count and lower development costs by simplifying system design, he added.

#### Cost advantage narrowed

Exley predicted that the cost advantage per Mips of small micros over large mainframe will be narrowed by the use of MOS technology in mainframe logic. But he also said, "The present substantial cost advantage of the smaller systems will persist for some time to come."

Addressing the implications of the reversed price-performance curve for MIS managers, Exley said MIS will become less centralized within organizations. It will not be an easy

transition to make. When minicomputers began to be used for dedicated applications, MIS management was in many cases determined to retain control, especially of costs for new equipment. "In extreme cases, the central MIS department was transformed into something approaching a department of computer-use prevention," Exley said. But the rise of

low-cost personal computers has challenged MIS to maintain control while satisfying end users, he said.

For example, five years ago the cost of mainframe computing power was approximately \$80 per hour, Exley said; today, the cost of micro computing power is about 60 cents per hour. "That means it doesn't take much improvement in productivity



Exley

to justify putting computer power on a professional's desk," he said.

But every advance poses a new challenge. "However are we going to make all these things play together?" Exley asked his audience. "First, it isn't really necessary for all the systems at work in a large organization to play together. Second, the communications re-

quirements of users will differ widely." For these reasons, Exley said, he does not believe any single type of local-area net will become a universal solution. The cost of a local-area network will vary with performance, and performance involves more than transmission capacities, Exley suggested. A local-area network wired into the walls of a building that pro-

vides hundreds of connections also has hundreds of potential failure points, he said. But users will expect extremely high reliability, an architecture which minimizes the possibility of the entire network being down at once and tools for isolating faults when they occur. "It is not clear to me that any local-area network now available meets these requirements," he said, adding that a number of small local-area nets do fit the bill.

Standard operating systems will also contribute to computing price/performance gains, Exley said. But application code must be written to that operating system and not to a specific hardware set, he said. No operating system for 16-bit machines has yet emerged that plays the same role as Digital Research, Inc.'s CP/M in the 8-bit world, he said. As a result, for performance reasons, programmers frequently write machine-dependent code for 16-bit micros, Exley said.

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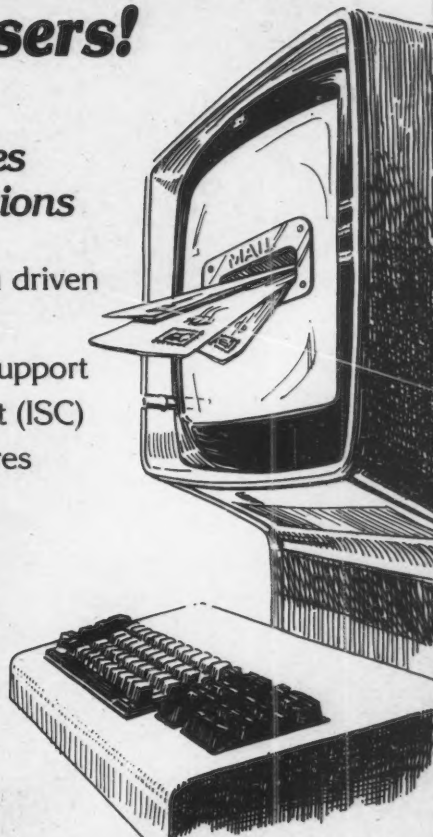
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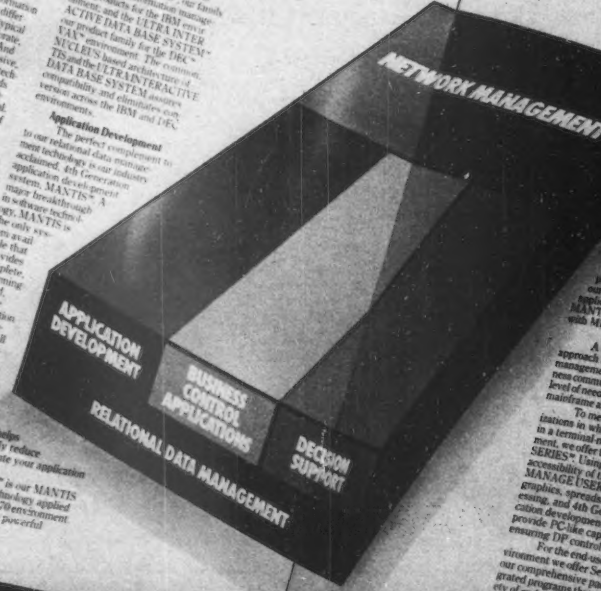
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believe our new products provide the highest degree of reliability, integration, performance and value in the industry. As proof, just look at our sales. From 1982 to 1983, **TIS** sales rose 136%, **MANTIS** sales rose 50%, and **MRPS** sales rose by 45%. For even more proof we invite you to personally compare our products with what our competitors are offering. Then you'll understand why the words "Excellence In Software Technology" fit so well under our name.



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## NEWS

# Executives resist micro, DSS combination: manager

Voice/data machines more warmly accepted than microcomputers in corporate culture



By Paul Korzeniowski  
CW Staff

NEW YORK — By placing microcomputers with decision support system (DSS) software on executives' desks, one will win more enemies than friends.

Jack Kelly, manager of management support sys-

tems at Xerox Corp.'s Computers Services in Los Angeles, made that claim at the Information Management Exposition & Conference (Info '84) held here last week.

Kelly, who is responsible for implementing DSS products at Xerox, attempted to introduce executives to DSS capabilities in 1981. The manager met with a great deal of resistance.

One major stumbling block was that corporate culture had not embraced microcom-

puters, Kelly said. Consequently, executives thought it was beneath them to work with the new equipment. When senior managers did test the machines, they were unable to operate them. And finally, most executives lacked typing skills necessary to enter data.

Resistance was so great that rather than force personal computers on skeptical managers, the company brought in products that combined voice and data processing. "Executives could operate a telephone, so they were not as frightened by these machines," Kelly noted.

Acceptance replaced downgrading as the voice/data machines became status symbols. "I really have no good reason why that happened," Kelly said.

Kelly said he hopes the managers can be weaned toward microcomputers. "Voice/data machines are moving in both directions," he said. "There are now a number of products available that combine complete personal computer capabilities into a telephone device." As these products appear, he said, executives will be more willing to use microcomputer DSS.

While executives shunned personal computers, accountants embraced them. "The benefits were so obvious," Kelly claimed. "As soon as an accountant saw a spreadsheet, he threw out all his green-lined paper."

But even accountants experienced problems. Kelly listed four of them:

■ It was difficult to keep track of different departments' data.

■ There were problems with extracting proper corporate data from a mainframe.

■ Consolidating various DSS models was tedious.

■ Individual models were poorly documented.

To solve the problem of tracking department data, his department built tables that linked data for the user. Extracting corporate data be-

came easier when Kelly's department wrote predefined query sequences. A personal computer version of the company's mainframe DSS was developed so that data could be consolidated on the mainframe rather than on a microcomputer. "The microcomputer was just not powerful enough to handle some models," Kelly said. With the personal computer package came a consistent method of documenting DSS models.



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## Oct. 29 meet to focus on micro issues

SAN FRANCISCO — A two-day conference called "Trends & Opportunities: The Next Five Years" will be held at the Fairmont Hotel here Oct. 29-30. The seminar, planned by Creative Strategies International, Inc. (CSI), will address issues on telecommunications and micros.

Day one's Telecommunications program will note changing technologies and new applications. The Oct. 30 Microcomputer talks will stress issues affecting industry participants' success.

The forum costs \$495 for one day; \$795 for two. There is a 5% discount for three or more from the same firm. CSI is at 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

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## NEWS

# Position seen key to information technology benefits



By John Desmond  
CW Staff

NEW YORK — Spending for information technology will not result in management productivity gains for all companies — more for those companies in good strategic positions before they decide to spend, according to the results of a study of 40 U.S. and European companies conducted by the Strategic Planning Institute of Cambridge, Mass.

The productivity study, based on 100 factors tracked from 1978 to 1983, concluded, "No evidence indicates that information technology applications by themselves spur the creation of business opportunities." The study's results were revealed by its director, M.C. Augustus van Nievelt, at the Information Management Exposition & Conference (Info '84) here last week.

Other key findings were:

- Information technology spending had a negative effect on management productivity in companies in nonstrategic positions. (A strategic position was developed by examining 30 factors, including market share and product quality.) "They were automating bad decisions. The more they spent, the worse it got," van Nievelt said.

- The study found no evidence that putting a microcomputer on every desk increased management productivity. "Just buying a computer is not the solution, contrary to what many advertisements would have us believe," van Nievelt noted.

- Spending for information technology continued to rise when the companies studied laid off 30% of their work force during the recession years from 1978 to 1982. Also, the number of managers rose in relation to support personnel — a development made possible by the advent of tools such as computer-aided design.

- Information technology spending took a growing share of management budgets in the companies studied, despite the work force reduction.

The companies studied ranged in size from small firms to Fortune 500 companies, said van Nievelt, who directs the institute's Management Productivity and Information Technology (MPIT) program. The study analyzed the cost of management with an emphasis on information technology expenses.

## Pims data base used

The institute chose the companies studied from the Profit Impact of Market Strategy (Pims) data base, van Nievelt explained. Pims provides for the planning activities of member companies, each of which contributes coded business information to the base.

For the MPIT study, van Nievelt defined management productivity as the value a manager adds to the organization, minus the manager's cost. Information technology included computers, data bases and software, word processing, communications devices, electronic reproduction devices and consulting services.

"Information technology should

*'No evidence indicates that information technology applications by themselves spur the creation of business opportunities.'* — from the

Strategic Planning Institute productivity study

improve management performance through increased value or lowered costs," he said, noting that such is not always the case. In some firms, he added, managers are provided with personal computers, but no link to a data base, rendering the micro little more than a glorified calculator.

The key for many companies in making effective use of information

technology is to incorporate the embedded experience of company personnel. "When a system is able to capture the expertise of a few in the organization and is able to broadcast the expertise to wider parts of the organization, the organization has leveraged the expertise," van Nievelt noted.

Such automation is resulting in or-

ganizational change, van Nievelt suggested. "We'll see organizations that are less complex and individuals within the organization who will have more control, with more to decide at their levels," he said.

The shift of power within the organization strips away redundant management layers and moves executives closer to operations and customers, van Nievelt said. As an example of the effect, he cited a European company that devised a computer program to provide auto body shops with paint colors based on factors such as a car's age and where it had been driven. By providing customers with a unique service, the firm effectively eliminated its competition.

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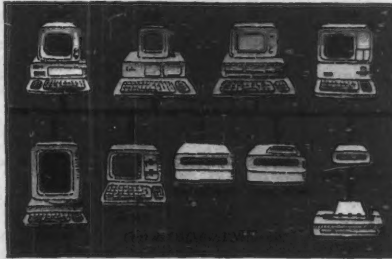
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## NEWS

# Apple priming Macintosh to crack corporate mart

By Edward Warner  
CW Staff

CAMBRIDGE, Mass. — Admitting that his firm's Macintosh computer has been "a hard sell in corporate America," Apple Computer, Inc. Chief Executive Officer John Sculley told a packed lecture hall here recently that his firm plans to introduce "a series of building blocks" over the next 18 months to help the Macintosh crack the corporate market.

In a later interview, Sculley refused to elaborate on his statement, except to cite the firm's already announced plans to produce a laser printer and develop a networking configuration that would link the computers and peripherals via their serial ports.

Sculley's otherwise upbeat presentation to roughly

from one student, Sculley said Apple would continue to "market very aggressively the Apple II at least until the end of the decade." He also said no new software would be produced for the Lisa micro, though a company spokesman later said some new Macintosh software will run on the Lisa.

Apple's management style

was also highlighted during Sculley's talk. Though he called IBM the "best managed traditional corporation in the world," he later said "there are no role models there for us." The average age of an Apple employee is 29 — the marketing manager for the Macintosh is 28 — and a section of the company's factory has arcade

games and a high-technology stereo sound system for worker recreation, he noted.

Sculley said he refuses to read anything longer than one typewritten page in order to promote brevity and clear writing among his subordinates.

Macintosh computers are now rolling off the company's highly automated Sili-

con Valley assembly line at the rate of one every 27 seconds, Sculley said, but it was only last year that the company's stock plummeted from \$73 to \$16 a share in the face of sluggish sales of the Lisa micro. Said Sculley: "Nothing helps you get your priorities in shape better than a life and death struggle."

*'... in big-brand marketing nobody remembers number three,'*

— John Sculley, chief executive officer, Apple Computer, Inc.

200 students at MIT's Sloan School of Management looked at the means by which Apple and IBM compete in a game he called "big-brand marketing." Apple wants to make microcomputer marketing "a two-horse race" because "in big-brand marketing nobody remembers number three," said Sculley, who also serves as the company's president.

For that reason, and to promote sales, Apple will spend \$100 million on advertising in the U.S. this year alone.

## 'Not going to conform'

Sculley vowed, though, that Apple was "not going to conform to IBM standards" in terms of machine compatibility, but would tie into IBM's network standards "as soon as those standards are announced." He added, too, that Apple "will obviously have to have some gateway products into the IBM world," adding that these will likely come from "strategic alliances with other companies."

The former Pepsico, Inc. marketing executive, brought on board by Apple in early 1983, said Apple expects to "earn their way in" the corporate offices, where he claimed there currently exists a pro-IBM bias among information managers. "Most information managers came out of IBM or were trained by IBM," he said.

In response to a question

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## NEWS

# Reporters go on-line to track politicians' votes, funding

By James Connolly  
CW Staff

Politicians throughout the South are finding that newspapers can track and cross-match their voting records with their political contributions, a practice that may show whether contributors get what they pay for.

Three newspapers in Florida began using computers to

monitor campaign contributions two years ago. Since that time, newspapers in Virginia and North Carolina have launched their own projects to discover where politicians get their money and whether those polls support their contributors' pet legislation.

"As a former political writer, bureau chief and now

editorial writer, I know how invaluable this type of information is. Who does a candidate owe his loyalty to — the voter or his contributors? The computer can help us find out," said Martin Dyckman, chief editorial writer for the *St. Petersburg Times* and chairman of the Florida joint monitoring venture.

The three Florida papers,

the *St. Petersburg Times*, the *Miami Herald* and the *Orlando Sentinel*, joined forces two years ago after each had tried manual contribution monitoring efforts.

A staff of up to eight people working in the press building near the state capital in Tallahassee takes candidates' fund-raising reports and keys in that data

through Texas Instruments, Inc. Silent 700 terminal/printers linked by acoustic couplers to Florida State University's Control Data Corp. Cyber 760 mainframe. The project, known as the Campaign Contributions Research Project and alternately as the Greening Project and Muckraker, leases space on the mainframe system.

Ann Driscoll, the project director, reported that on-line inquiries such as the total amount that a candidate received are answered within 30 seconds by the system, which uses Intel Corp.'s S2K Manager data base management software. She said longer reports — such as listing all contributors to a candidate, contributions from outside the candidate's home district or contributions from special interest groups — can be printed on high-speed printers at the university.

## Monitoring legislative races

Two years ago, the project monitored the gubernatorial, cabinet and legislative races. This year, with no statewide election, it is watching 141 legislative races.

Dyckman reported that in some instances the special interest groups who contributed the most money to candidates in 1982 had the best success when legislation was voted on in 1983.

According to Driscoll, the papers split the \$85,000 to \$90,000 cost of running standardized hard-copy reports, which list candidates, their contributors, details such as the contributors' addresses and occupations and the contributions of political action committees. The papers can also use their own Teleram Communications Corp. terminals to make more specific inquiries about special interest groups or individuals. These inquiries are kept confidential because the three papers compete for a statewide readership, she noted.

In Virginia, *Richmond Times* reporters Ray McAllister and Mike Grimm are preparing a series of stories about corporate and political action committee contributions in recent elections and how incumbents voted on bills of interest to those contributors.

McAllister and Grimm ran their contribution study on the newspaper's parent company's Hewlett-Packard Co. HP 3000 III minicomputer running SPSS, Inc.'s Statistical Program for the Social Sciences.

Meanwhile, North Carolina's *Charlotte Observer* and the Institute for Southern Studies, a Durham, N.C., research group, have kicked off their own contribution monitoring projects. Both set up their systems this year.



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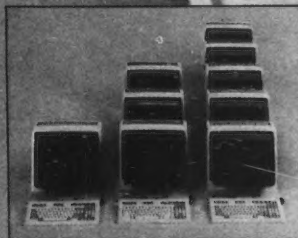
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## NEWS

# Session stirs disagreement on VDT-related threats

By Charles Babcock  
CW New York Bureau

NEW YORK — Although critics still charge they are hazardous, VDTs do not emit any radiation known to be harmful, according to the West German scientist who investigated them for his government.

Ahmet Cakir, manager of the Ergonomic Institute for Social and Occupational Sciences in Berlin, told a New York conference that numerous studies show that the X-ray and ultraviolet radiation generated by VDTs is very small and is confined to the CRT.

"Discussion of the matter has created a new hazard — anxiety in pregnant women," Cakir told 150 listen-

ers at the World Conference on Ergonomics in Computer Systems here recently.

Another speaker, Laura H. Stock, coordinator of the Berkeley, Calif.-based VDT Coalition, said she continues to receive anecdotal evidence of hazards by talking to women who use VDTs.

"It's impossible to prove a negative, that a hazard doesn't exist," which is what critics are asking employers and the government to do, Cakir said. "I don't recommend we forget about it, but we can be calm about it."

One reason users of VDTs remain uneasy, despite studies showing no hazard exists, is because they re-

member the government once told them no danger existed from atomic tests, and some people who believed what they were told suffered for it, he added.

Frequent "sensational" news stories have created such alarm among VDT users who many have sought to be transferred from VDTs during a pregnancy or for the duration of childbearing years, he added.

Cakir did cite a 37% growth in neck, spine and back pain complaints among female data entry and clerical workers between 1975 and 1979, when VDTs came into widespread use. Such complaints now constitute one-third of the cost of health insurance in West Germany for female of-

fice workers. No such spurt in complaints occurred among blue-collar female workers, Cakir said.

Cakir and Stock agreed that VDTs have changed the workplace and in many cases are the focal point for complaints about new stresses that accompanied the change.

Job regimentation, loss of personal contact and impersonal task assignment have threatened to break down the social fabric of the office and could impact workers' health, Cakir said.

"All work can be routed through a terminal. When one job is finished, the next automatically flashes on the screen," Stock said.

And the fact that a supervisor can monitor the total number of keystrokes executed by each worker at the end of the day lends a spying aspect to routine computer counting, she said.

For the majority of VDT users, who are women with average incomes of \$12,000 per year, office work more and more resembles assembly line factory work, she said.

Cakir said studies have been made of VDT users who spend as much time at terminals as female clerical workers, but who exercise more control over their jobs. These users tend to have fewer health complaints. News editing and computer programming were two occupations included in the latter study.

A problem with European VDTs that did not occur in the U.S. was screen flicker, caused by machines that operated at 50 Hz instead of the 60 Hz common in the U.S. The eye fatigue that resulted was one of the problems that lead to VDT standards in West Germany and the Scandinavian countries, Cakir said.

Stock said her anecdotal evidence on the hazards of VDTs came from female workers at United Airlines in San Francisco who told her 24 out of 58 women have had miscarriages or children with minor birth defects.

She said she did not know what would cause such a high rate of reproductive disorders. "All I know is people tell me they have suffered these effects, and they seem to occur in clusters among women who use VDTs," she said.

## Research study

Stock also cited recent research in Spain that found chick embryos were changed by exposure to conditions similar to what VDT workers encounter. Known as the Delgado study, its results have been duplicated in Spain, she said.

Stock agreed that there appeared to be no X-ray or ultraviolet radiation hazard from VDTs, but she said low-level, low-frequency electromagnetic pulses coming from VDTs may have an undetermined impact on human health.

Cakir said workers in modern cities frequently encounter electromagnetic pulses, but they have not been shown to cause harm. "We are surrounded by radio waves," he said. "Are we all sick?"

Cakir is the author of *Visual Display Terminals*, a 275-page book that describes the basic technology and uses of terminals. The World Conference on Ergonomics was sponsored by L. M. Ericsson, the Swedish telecommunications manufacturer.



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## VDT user health standards: unwanted solution for some

By Charles Babcock  
CW New York Bureau

NEW YORK — What solutions to problems in ergonomics did attendees of the recent World Conference on Ergonomics in Computing Systems most want to see?

Some said better use of the traditional design elements of sculpted keyboards, swivel chairs and non-glare screens.

Others said the quick adoption of advanced input devices, such as touchscreen and voice-activated commands.

A third group said beating back

the growing desire to set standards to solve problems in ergonomics.

Twenty states are considering legislation that would govern issues such as how much time office workers can be required to spend at VDTs or whether a pregnant woman should be given an automatic transfer out of a position that requires use of terminals.

Several European countries already have such standards, said speakers at the conference at the Plaza Hotel here.

### 'Temporary, total disability'

In 1983, a Canadian judge in Quebec recognized the complaints of a VDT worker about fatigue, anxiety, dizziness and headaches as a "temporary, total disability," said speaker Robert W. Bailey, a former researcher in the Human Performance Technology Center of Bell Laboratories and now president of his own firm, Computer Psychology, Inc. in Mendham, N.J.

In San Francisco this year, a judge awarded \$2,174 to a VDT worker who said she was unable to read, watch television or tolerate bright light after spending as much as nine hours a day at her word processing job, Bailey added.

In Maryland, a coalition of labor groups, including 9 to 5 and the International Typographers Union in Baltimore, is lining up behind a proposal slated to be introduced into the next session of the state legislature. The proposal seeks to limit the time a person can spend at a VDT to four hours a day, said Brian W. Christopher, executive director of the Maryland Committee on Occupational Safety and Health, a private, nonprofit agency monitoring support for the proposal.

Edward F. Feist, general manager of Spencer Data, a keyboard entry contract service located in Lakewood, N.J., said he would oppose writing into law a limit on the number of hours a person could spend at a VDT a day.

### Limit time to four hours

"One of 9 to 5's recommendations is to limit time at a VDT to four hours. That could force a whole group of people into part-time employee status," said Feist, whose company uses 150 terminals. Spencer Data employees only type in documents, and Feist said members of 9 to 5 recoil at the tedium of such a job.

"We hire 40 people a year. Half of them we train and they consider it a step up. [Being a] VDT operator is better than being a waitress," he said.

Feist is drafting a position paper on ergonomics for the Delaware Valley Data Entry Users Group and in it will warn against arbitrary standards.

"One of the issues that scares me is the adoption of standards," said a psychologist employed by a large computer manufacturer, who asked not to be identified. "The Europeans require a certain height for the home row on a keyboard. There's a growing wave to come up with the answers here in the U.S. and the answers don't exist yet," the psychologist said.

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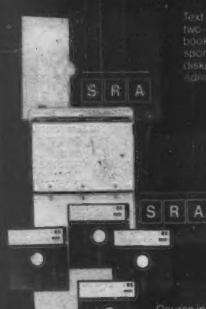
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## NEWS

# Federal filing systems forcing policy reviews

WASHINGTON, D.C. — Efforts by several federal agencies to establish electronic filing systems raise a host of complex public policy issues that will be addressed in hearings next year, according to Rep. Glenn English (D-Okla.), the chairman of the U.S. House Subcommittee on Government Information, Justice and Agriculture.

In a recent speech to the Information Industry Association (IIA) here, English said he neither supports nor opposes the electronic filing systems,



English

but said they raise such policy questions as whether the government's contractor should be given a monopoly over government data and whether the systems will curtail public access.

English discussed agency plans to use computer and telecommunications technology to automate document

collection, storage, retrieval and dissemination activities. Automated systems are planned for the Securities and Exchange Commission (SEC), the U.S. Patent and Trademark Office, the Federal Maritime Commission and the U.S. Department of Agriculture, he said.

The SEC, for example, is implementing an electronic data gathering, analysis and retrieval (Edgar) pilot program enabling public companies to submit regulatory filings to the SEC electronically, as well as permitting electronic retrieval by the public.

### First electronic filing

The pilot contract was awarded to Arthur Andersen & Co., the accounting and consulting firm, and the first electronic filing was made last week, according to SEC officials.

In his speech, the congressman raised a few of the policy questions he said his subcommittee is investigating:

■ "Will the granting of monopoly rights over information distribution be a necessary element of contracts for the operation of electronic information systems?"

■ "If agencies develop systems using different hardware or software, will we end up with inconsistent or incompatible standards that will ultimately increase cost to the government and to the private sector?"

■ "Will contracts for electronic data system operations require agencies to curtail information availability?"

■ "When a contractor receives information for redissemination, how does an agency prevent the contractor from taking advantage of the fact that he is the first to have access to the data?"

In the case of the SEC's Edgar program, the latter issue already has surfaced. One of the losing bidders for the Edgar pilot project has raised the question of whether Arthur Andersen, whose business also includes advising clients on the content of reports filed at the SEC, would have inside access to the securities filings, according to IIA officials.

The SEC apparently is aware of such issues. Last month the commission sought public comments concerning the full-scale system contract to be awarded next year, raising questions about the monopoly issue, access fees and to what extent the SEC should regulate the contractor.

Concerning the contractor's access to inside information, the SEC said that the system affords all users immediate access to the data base. "The SEC's contractor has no more rapid access than the financial information services industry or the securities industry to the updated data base," the SEC stated.

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## Venture capitalism changing

By Maura McEnaney  
CW Staff

CAMBRIDGE, Mass. — High-technology entrepreneurs seeking financing for their start-up companies are facing tough scrutiny from venture capitalists who today are taking fewer chances with start-ups than they were several years ago, a California high-technology law-

yer said recently.

Speaking at a two-day seminar sponsored by the Computer Law Association, Inc. and the New England Computer Law Forum, Miles Gilburne of Blanc, Gilburne, Peters, Williams and Johnston, based in Los Angeles, said the last 12 months have created a new reality within the venture capital industry

— one that has investors taking a more conservative approach in their financing decisions.

Between 1978 and 1981, "there was a true spirit of intoxication in the industry," Gilburne said, bringing an infusion of venture capital to the computer industry. Anticipating rapidly expanding markets, venture capitalists quickly invested their money in everything from software companies to chip manufacturers, hoping to make the large profits expected by their partners, he said.

But, according to Gilburne, increased competition within the computer industry has brought decreased company earnings as well as some significant company failures, causing the once generous venture capitalists to take a closer look at their investments and harden their deal terms. As a result, he said, this new reality has eliminated the viability of once common financing scenarios.

One such scenario, Gilburne noted, is "coattail" financing for companies planning to enter an area of the mass market (personal computers, for example) that is already occupied by a number of major players.

Investors are also shying away from long-term projects involving emerging technology like artificial intelligence because those companies are "slow to produce meaningful markets," he said.

In addition, venture capitalists are no longer relying on the theory that companies started by previously successful entrepreneurs will likewise succeed, he said.

### Advice for start-ups

Because this new reality has made it increasingly difficult for entrepreneurial companies to secure financing, Gilburne offered a number of suggestions.

Entrepreneurs should first take the time to develop a sophisticated business plan and be sure of financing before making the leap from their established jobs to work on their start-up company, he said. Otherwise, changes in the market can alter plans for the product, and financing delays can quickly deplete seed money, he warned.

There is, however, a new type of financing vehicle that has recently emerged as a viable option for start-ups. According to Gilburne, the "strategic partner," can provide different forms of financing, including straight equity financing, debt, convertible debt, large advance orders and joint ventures in which proprietary rights are shared.

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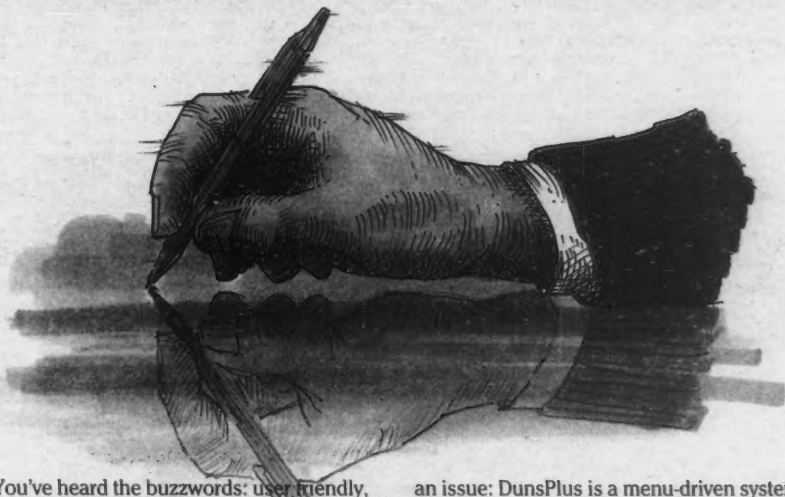
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## NEWS

# Financial departments to gain by influx of computers

By Charles Babcock  
CW New York Bureau

NEW YORK — Corporate treasurers using microcomputers linked to minicomputers and mainframes will be able to expand their role over the next five years, said Donald E. Smith, president of Manufacturers Hanover's Financial Management Systems, Inc.

With the help of computers, the corporate treasury staff can become the focal point for a variety of judgments on the corporation's affairs. Using microcomputers to work with information gleaned from minis and mainframes, the treasurer can better evaluate the flow of money and perform long-range planning, Smith said.

Smith addressed an assembly of 200 corporate treasury representatives recently at Manufacturers Hanover's world headquarters in New York. Its Financial Management Systems provides consulting services, including custom software, to corporate treasury departments to help automate their tasks. Computers allow the cor-

porate treasurer to have access to the day-to-day transactions of the company as never before and also to evaluate the movement of money within it, Smith said.

One task that computers help the treasury staff perform is keeping track of corporate cash flow. "Let's try to make sure it's not in more than one pocket at a time, un-

less it's our pocket," he said.

Mainframes, with their prodigious capacity to organize and store data, are tied to the accounting functions of a corporation, Smith noted. Analysis of the data base and reaching decisions based upon it is a task that may best be performed by a microcomputer. And strategic planning, in which "what-if" questions are applied to data that summarize today's decisions, may best be performed by a microcomputer, Smith said.

"The ultimate view of where technology and the corporate treasurer are head-

*Such an interconnected system is still in the future. It may be five years before it is developed.*

ed is to what I call the three 'Ms.' That is a mainframe or maxi, a mini and a micro working in concert to accomplish all the functions necessary to truly support treasury operation," Smith added.

Such an interconnected system is still in the future. It may be five years before it is developed, he said.

In a related announcement, Manufacturers Hanover spokesmen announced that larger companies are putting microcomputers to work in their treasury operations more quickly than smaller ones.

Eighty-seven percent of the treasury departments of companies with revenues of \$1 billion or more are using microcomputers. Only 67% of treasury operations in companies with revenues ranging from \$100 million to \$500 million are using micros, while 73% of the mid-range companies, whose revenues range from \$500 million to \$1 billion, are using micros, according to the survey.

The survey of treasury managers was conducted by Louis Harris and Associates for Manufacturers Hanover, 270 Park Ave., New York, N.Y. 10017.



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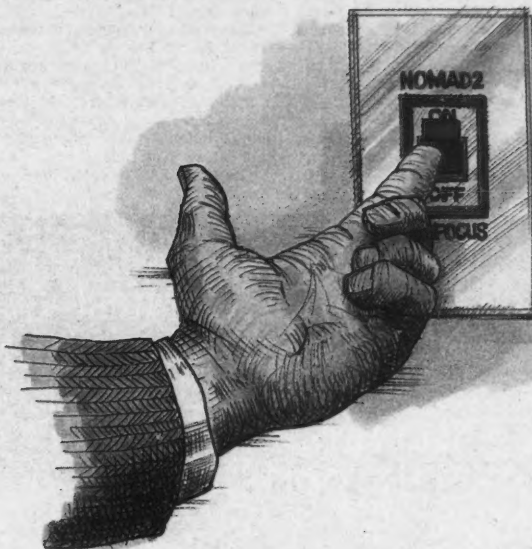
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## NEWS

## Micro software deluge may impede standard setting

### Report finds managers at odds with rising prices, compatibility void

WASHINGTON, D.C. — The lack of control over software packages that are purchased for microcomputer workstations has left managers in the private sector and the federal government groping for answers on how to reduce spiraling costs and enforce compatibility standards, according to an Arthur Young & Co. report.

The report, recently released at the Federal Computer Conference here, said the desire of managers to operate their own microcomputer workstations has led to an uncontrolled growth in software acquisition.

The software purchased to run on these systems has not been required to fit into an overall software standards strategy, and "few companies have attempted to define and enforce standard applications," the report said.

#### Micro software use

However, both private sector companies and government agencies have taken some steps to take advantage of micro software utilization in their environments, according to the report.

These steps include attempting to negotiate volume discount purchases, avoiding duplicate software

evaluation exercises and limiting the range of differing software systems that must be supported.

The survey examined nine U.S. corporations and 13 federal agencies to see what levels of management controls were in existence for microcomputer support. It was completed in 1983, according to Arthur Young, a Big Eight accounting firm.

The results indicated that while both the private sector and the federal government had few concrete policies in place to control software proliferation, there were marked differences in the degree of support offered to users.

All of the private sector concerns actively monitored technology trends, disseminated information on technology, assisted users in selecting hardware, provided troubleshooting during operations, evaluated software packages and negotiated volume discounts.

However, only four companies designed and delivered training programs for users. Three concerns had established policies requiring compatibility between central mainframe architectures and micro software, and one had ordered standardized applications packages.

There is much less centralized con-

trol in federal agencies, particularly within the Department of Defense, the report continued. This was generally limited to efforts to promote the use of micros in government work and assistance to users when they were selecting a microcomputer or wished to negotiate volume procurements.

No mechanisms have been established to monitor the extent of proliferating software within federal agencies. Instead, procurement decisions have been left to the users of the shared system, who take responsibility for pushing the request through the bureaucracy, the report noted.

## Meet to offer managers tips on net control

NEW YORK — Helping telecommunications managers to manage their networks better through 12 working strategies will be the focus of a two-day conference Oct. 22-23 at the Omni Park Central Hotel here.

"Twelve Telecom Management Strategies to Succeed in the Multi-Vendor Environment" is sponsored by BCR Enterprises, Inc., publishers of *Business Communications Review*.

The conference will present attendees with solutions for both voice and data communications problems proposed by industry representatives who have successfully implemented these methods.

#### Strategies to be discussed

Strategies to be discussed include restoration of one-stop shopping, evaluation of long-haul and local-loop alternatives, contract negotiation for the new era, computerized tools for telecommunications management and strategic planning for telecommunications.

At the conference, 17 telecommunications managers, consultants and suppliers will offer their approaches to dealing with problems such as loss of end-to-end service, bill reconciliations and validations and circuit delay.

The program costs \$775.

More information about the conference is available from BCR Enterprises, which is located at 950 York Road, Hinsdale, Ill. 60521.

With IRMA's latest innovation, a remote PC can reach the mainframe when all the ports are full.



## NEWS

## Ecuador gets South America's second videotex system

QUITO, Ecuador — Last June, the South American country of Ecuador became the second country on that continent to establish a commercial videotex service.

Like Brazil, the only other South American country using videotex, Ecuador installed a French system based on France's Postal Telephone and Telegraph Administration's (PTT) Teletel videotex software and Minitel terminals. The system was installed by Banco Popular, one of Ecuador's largest banks.

Andrés Vallejo Arcos, bank vice-president, claimed, "The bank has always been preoccupied with having the most advanced technology and offering the most modern services to

its clients. In the case of the videotex system, we made a special effort for it to [happen].

"We wanted to offer primarily home and office banking services, but other videotex services like general news, games, horoscopes and recipes are also available," he explained. As the system's operator, Banco Popular reportedly is negotiating with potential service providers, including newspapers, travel agencies, airlines and department stores.

Initially, 200 Minitels were installed in Quito and Guayaquil, the country's two most heavily populated cities. The Minitels and the videotex services are available to customers at a base rate of \$30 per month,

which includes a choice of three types of terminals — color Minitels, monochrome Minitels or TV decoder devices with keyboards.

### Future installations

Francois Vivier, the director of operations at Intelmatique (the marketing agency for the French PTT), supervised the installation in Ecuador and said plans call for an additional 750 Minitels and decoders this year.

"Eventually," he noted, "Banco Popular expects to support 3,000 to 4,000 terminals which will serve the general population with all the traditional videotex services."

According to Manuel Mejia Dalmau, head of Banco Popular's data

processing department, the bank chose French technology after comparing it with systems from the U.S., Canada, Britain and West Germany.

"Some of [the systems] stressed sophisticated graphics," he said, "but we plan to use only limited graphics at the beginning to catch the user's eye," he explained.

"I am convinced that videotex users will not [want] to complicate the page with graphics, which are costly and take a lot of time to appear when the user is waiting for his account balance."

### 'The future of information'

"French Teletel was simple to use and comparatively inexpensive," Dalmau indicated, "and we definitely think that videotex, together with microsystems, constitutes the future of information in the world."

In creating the system for Banco Popular, Intelmatique consultants came up with a system that could be fully integrated with the bank's computerized data processing system.

Since there was no existing X.25 network in Ecuador, a private line with X.25 transmission was constructed over the 250 miles between Quito, in Ecuador's mountainous interior, and Guayaquil, on the Pacific coast. The coastal city became the site for a concentrator that handles videotex and telephone traffic and routing. Because the mainframe and the concentrators are linked by the dedicated X.25 line, access to videotex service from either city will cost no more than a local phone call.

"The bank's Burroughs' [Corp.] mainframe was already serving them internally," Vivier explained, "but what the bank needed was a front-end solution to make those same [DP] services — or part of them — available to customers outside the bank. Instead of creating a stand-alone videotex center, we integrated the videotex system with the bank's existing Burroughs computers."



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## Guide explores micro-CPU link

MATTAWAN, Mich. — A guide to understanding and implementing a communications link between personal computers and mainframes is available from Information Research, a microcomputer testing firm based here.

The second edition of "Making the Micro-Mainframe Connection" includes product reviews and tips on installation. The 40-page booklet primarily uses the IBM Personal Computer for the testing. Products tested include Micro-Tempus, Inc.'s Tempus-Link and Tempus-Data, Technical Analysis Corp.'s Irma board groups and CXI, Inc.'s Pcox.

Other reports available from the company include "Word Processor Comparison Tables" and "Critic's Guide to Local-Area Networks."

The guide and other reports sell for \$39.95 each, including shipping and handling, and are available from Information Research, 10367 Paw Paw Lake Drive, Mattawan, Mich. 49071.



## NEWS

## Sicob showcases micros; distribution a focal point

By Luc Sala  
Special to CW

PARIS — The Sicob show in the prestigious Parisian exhibition center, la Defense, started out as a computer and office automation show, but over the years has evolved into a more general computer show, embodying home computers, peripherals and a special OEM section. Each year, there are two Sicob shows, but the one in autumn is usually the larger, with a total attendance of over 40,000.

This year's fall Sicob took place Sept. 19-28. IBM was on hand with the Personal Computer AT for the first time in Europe, and a number of other manufacturers including Data General Corp. and Ericsson Information Systems, Inc. chose Paris as the launching platform for new products. But apart from DG's impressive portable DG/One with 3.5-in. microfloppies, AT&T's Unix operating system and software to integrate the DG/One into the CEO environment of the larger DG machines, most of the attention went to the IBM product.

The Macintosh from Apple Computer, Inc. was one of the main attractions at the show, but there was a lack of good local (French language) software for it. Apple is already preparing their dealers for the Macintosh, which is expected to be introduced here shortly.

Digital Equipment Corp. took the occasion to display its Crystal operating environment software, billed as an alternative to windowing.

But because of the somewhat chauvinistic attitude of French customers and also of the French government, indigenous products have the inside track. Imports — even from other European Economic Community countries — are not of-

ficially limited, but hampered in practice.

While the sales projections for the personal computer market are still bright, the frenzy has gone. IBM is being watched closely by its competitors, and non-IBM-compatible products are given little hope of success. Distribution has become a main focal point. Gone are the days of the back room computer shop, and only the big brand names have a real presence in the computer store franchises. The lesser known

machine makers will have to reconsider their marketing approach. Some of them, for example DEC, with a new Professional 380, will go back to their OEM customers.

Televideo Systems, Inc.'s International Sales Vice-President Alan Platt indicated that Televideo is also refocusing. "We are turning away from the computer shops and the big chains and see our main strength in the value-added resellers, where the vertical market approach is more important. The

first- and second-tier distribution with simple retailing, and even package retailing, is less appropriate for our products now. We are offering high-end [personal computers] and multiuser [personal computer] systems now, which require the support [value-added remarketers] can give."

*Sala is the editor of a European microcomputer newsletter and a frequent contributor to Computerworld.*

## Meet to examine DP in food mart

DALLAS — The role of computers in the food industry will be the focus of the National American Wholesale Grocers Association's (Nawga) Computer Conference and Exposition to be held at Loews Anatole Hotel here Oct. 28-31.

According to the sponsor, the target audience for the conference includes grocery wholesalers, food manufacturers, food service distributors, convenience store operators and specialty wholesalers.

Six general assemblies and 40 workshops will cover topics such as "Automatic Reordering," "Computerized Backhaul," "Customer Profitability Analysis," "Direct Store Delivery," "Distribution Billing and Inventory Control," "Financial Planning" and "Labor Planning."

The cost to attend the conference and exposition is \$395 for Nawga members and \$595 for nonmembers.

Nawga is located at 201 Park Washington Court, Falls Church, Va. 22046.



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## NEWS



**INTERNATIONAL  
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**AUSTRALIA**

**CLAYTON** — Racal Australia Ltd. has agreed to manufacture and market abroad the local-area network designed here by Monash University.

**TOTTENHAM** — After a four-year relationship, Olex Cales Ltd. is about to drop its present vendor, Tandem Nonstop Pty. Ltd., in favor of another unnamed vendor. Olex, which has roughly 50 subsidiaries throughout the country, became Tandem's third installation in Australia in 1980.

**BRISBANE** — The discrepancy of funds allocated to computer science students compared with those garnered by engineering students in Australian universities was the subject of hot debate here recently. According to Andrew Lister, University of Queensland computer science dean, the imbalance has forced undergraduates into grossly overcrowded classes relying on obsolete equipment. Lister told the Australian Computer Society conference that the university spends on computer science students just 58% of what engineering students are allotted.

**FRANCE**

**PARIS** — CII Honeywell-Bull has introduced the Bull Questar 400, a series of monochrome and color work-

stations designed for use with the Bull information system product line within a direct storage access network.

The Questar 400 workstations feature cluster architecture and can operate as stand-alone workstations or interactively with a host processor, according to the vendor. Sources reported that Honeywell, Inc. will soon announce the workstation product in America.

**JAPAN**

**TOKYO** — Quotation Information Center K.K. and Hitachi Ltd. jointly announced an English-to-Japanese automatic translation software system. The product runs on Hitachi's Hitac M-240H mainframe, comes with a dictionary data base of 70,000

words and can translate the English language at about 20,000 word/hour, according to the vendors. Quick plans to use the system to translate English economic publications and market the information as a service to Japanese financial houses.

At the same time, Fujitsu Ltd. launched two automatic translation systems, called Atlas-1 and Atlas-2, that translate English-to-Japanese and Japanese-to-English, respectively. These systems have dictionary data bases of 50,000 words and can reportedly translate at rates up to 60,000 word/hour. These products run on Fujitsu's Facom M series of mainframes and the S-3000 series of minicomputers. They will lease for \$1,500/mo and \$2,300/mo, respectively, when they become available next spring, the vendor said.

**NETHERLANDS**

**AMSTERDAM** — After bidding against IBM, Sinclair Research Ltd. and Acorn Ltd., the Dutch company Tradecom won the rights to sell its Newbrain microcomputers in India. Some 1,500 systems will go on the Indian market this year, sources reported.

**AMSTERDAM** — European automakers have banded together to create the Organization for Data Exchange by Teletransmission in Europe. The computer-based exchange will operate among manufacturers, subcontractors and related supply industries, according to a spokesman.

**UNITED KINGDOM**

**LONDON** — New partners IBM and British Telecom International are clashing over who will link insurance companies here. The two firms have entered rival proposals for a data communications network to the British Insurance Association. The competition, which comes despite the two giants' recent agreement to run IBM's data network together, will pit British Telecom's Packet Switch-stream Network against the IBM network.

**LONDON** — Brian Oakley, director of the fifth-generation Alvey project, has been rethinking the UK's research strategy. He wants to establish a hardware systems architecture directorate to "draw together all the architectural strands within the various elements of the project and [apply] real thrust to that element."



"That's the first microdot we ever produced."

**Lotus™**

**Symphony™**

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program allows you to access information up to 15 times faster than a floppy.

Without all this the NCR PC would still be an exceptional value, with special keyboard enhancements that make it easier to work with spreadsheets and databases, plus hardware standards way beyond industry standard.

Which is exactly what you'd expect from NCR.

Which is exactly why, when you look at the big picture, you're looking at NCR.

NCR Corporation, World Headquarters, Personal Computer Division, Dayton, OH 45479. (513) 445-7478.

**NCR** THE BIG, PERSONAL, COMPUTER COMPANY.



## NEWS



## BOOK REVIEWS

**INFOWORLD'S  
ESSENTIAL GUIDE TO  
THE IBM PC**

Edited by Frank Derfler Jr.  
and the editors of Infoworld

The Infoworld format of  
explanatory articles fol-



lowed by reviews works well  
translated from the magazine  
to a book.

The articles tell where to  
find help (users groups, per-  
iodicals); how to commu-  
nicate with the IBM Personal  
Computer (mainframe links,  
local networks, file servers);  
and how to transfer software  
(running CP/M programs by  
emulator or Zilog, Inc. Z80  
processor boards).

In the review section, Ad-  
vanced DB Master from  
Stoneware, Inc. ranks high in  
the data base manager cate-  
gory, as does Data Base Man-  
ager II from Alpha Software  
Corp., described as "a prod-  
uct of the future" available  
today.

Norton Utilities from Pe-  
ter Norton Computing wins  
excellent marks in all areas  
— performance, documenta-  
tion, ease of use and error  
handling — as elegantly de-  
signed. The product primar-  
ily helps users recover lost  
data.

The MT 160-L from  
Mannesmann Tally Corp.  
scores high as a dot matrix  
printer, as does the Hayes  
Microcomputer Products,  
Inc. Smartmodem 1200 as a  
modem.

For the well-supported  
reasons behind these choices,  
you need to read the book.

Paperback, 244 pages,  
\$16.95, ISBN 0-06-669002-1.  
Harper & Row Publishers,  
Inc., Electronic and Techni-  
cal Publishing, 10 E. 53rd St.,  
New York, N.Y. 10022.

**COMPUTER  
OPERATIONS  
TRAINING**

By Peter Berkeley

"Training was virtually  
nonexistent," the author  
writes about a visit to a for-  
mer employer. "Turnover  
was high, morale was a prob-  
lem and operators were be-  
coming frustrated at getting  
nowhere fast, in terms of a  
career." So Peter Berkeley  
launched a training program  
for this troubled operations

center. The outgrowth is this  
book.

The focus is on the back-  
room workers, the unseen  
275,000 estimated in 1980 to  
work in computer opera-  
tions. They lack the formal  
education to move into pro-  
gramming, and yet that is ex-  
actly the next step they want  
to take.

Managers must assess the  
state of their operations  
training. A major section of  
the book comprises forms to  
be filled out to identify train-

ing needs at various func-  
tional levels.

Berkeley emphasizes the  
different training required  
for task-oriented operators,  
function-oriented program-  
mers, analysts and managers.  
Programmers increase their  
knowledge about a subject.  
Computer operators increase  
their experience by doing  
specific tasks. In-classroom,  
generic courses may suit pro-  
grammers, but computer op-  
erators need training at their  
work site in the specific jobs

they are expected to do. The  
author argues that computer  
operations requires a full-  
time training officer who  
comes from that particular  
background.

Trained operations per-  
sonnel will look, of course,  
for promotions. Job descrip-  
tions set up the environment  
in which they can move, pre-  
scribing the abilities and edu-  
cation needed to move up.  
This book presents 25 pages  
of sample job descriptions.

Currently, Berkeley says,

"There are no career guide-  
lines/paths to follow. And  
there has been no concerted  
industry effort to remedy  
this situation."

There are benefits to em-  
ployer and employee alike:  
"If operators are to be more  
efficient, if production is to  
keep up with the increasing  
demands on the computer  
center, if attitudes toward  
work and the organization  
are to improve, if morale is to  
improve, there has to be a ca-  
reer path for operators,

# SURPRISE. YOU JUST TURNED INTELLIGENT PCs INTO DUMB



# PROTOCOL. THE END OF THE DP



## NEWS



Van Nostrand Reinhold Co.,  
135 W. 50th St., New York,  
N.Y. 10020.

**THE HANDBOOK OF  
COMPUTERS AND  
COMPUTING**  
Edited by Arthur Seidman  
and Ivan Flores

which will combine formal training activities with on-the-job activities."

Hardcover, 322 pages,  
\$29.95, ISBN 0-442-20993-2.

Dictionaries often offer just enough of an explanation to spark new questions. This handbook from Van Nostrand goes much further, covering a vast amount of

computer terminology from the top down. More than 50 writers explore major topics in overviews that work their way clearly and precisely to definitions of individual words. Tricky terms and concepts are more easily understood as presented here.

Increasing specialization and rapid technological advances make it difficult for even the most experienced to keep up in all areas. This book offers the basics and then goes quickly into details

in subjects such as very large-scale integration, microprogramming, documentation, robotics, Fortran and data base technology.

Hardcover, 896 pages, 630 illustrations, \$77.50, ISBN 0-442-23121-0. Van Nostrand Reinhold, 135 W. 50th St., New York, N.Y. 10020.

## BOOKS OF NOTE

## DIRECTORY OF INFOR-

**MATION AGE NEWSLETTERS**, a directory of 350 publications, published by Frank Communications Group. Spiral-bound paperback, 65 pages, \$95, Frank Communications Group, P.O. Box 144, Mont Vernon, N.H. 03057.

**TECHNOLOGY CROSSING BORDERS**, a look at the management of international technology flow, edited by Robert Stobaugh and Louis T. Wells Jr. Hardcover, 329 pages, \$29.50, ISBN 0-87584-158-9, Harvard Business School Press, Boston, Mass. 02163.

**COMPUTER GRAPHICS GLOSSARY**, a guide for the computer-aided design and manufacturing professional, by Stuart W. Hubbard. Paperback, 100 pages, \$15.50, ISBN 0-442-23618-2. Van Nostrand Reinhold, 135 W. 50th St., New York, N.Y. 10020.

**THE COMPUTER DATA AND DATABASE SOURCE BOOK**, an encyclopedia of public and commercial data bases accessible by computer, by Matthew Lesko. Paperback, 900 pages, \$9.95, ISBN 0-380-86942-x. Avon Books, The Hearst Corp., 1790 Broadway, New York, N.Y. 10019.

# ALL OF YOUR TERMINALS.

It's a classic DP nightmare.

Your company just spent a fortune to buy PCs, and put all that processing power on people's desks. Now it's your job to give those PCs access to your mainframe.

Here's where something horrible happens.

The host communications board you add converts your smart PCs into dumb 3278 terminals. Terminals that can only handle one task at a time. Terminals with none of the intelligence and processing power you paid for in the first place.

Is there no end to this nightmare?

## INTRODUCING PCI-LINK™ THE FIRST SMART WAY TO LINK AN IBM PC TO AN IBM MAINFRAME.

Relax.

Now there's PCI-Link™ from Protocol Computers. The first add-on communications board that doesn't turn a smart PC into a dumb 3278 terminal.

With PCI-Link, your PC can access an IBM mainframe, and virtually any other ASCII device—computer,

the smartest communications board you can buy. Like an on-screen floating calculator and electronic notepad. Pop-up menus for ease of use. 3278 keyboard mapping options. User defined macros. Even a special status line in addition to the standard IBM 3278 status line.

And all of PCI-Link's power and functionality is mouse supported.

Is that smart or what?

## FOR MICRO TO MAINFRAME COMMUNICATIONS, NO ONE TALKS TO IBM LIKE PROTOCOL.

PCI-Link is just one reason why Protocol Computers is the leader in communications technology.

In 1980, we introduced the first successful protocol converter. And today, PCI is the only single resource with a complete array of mainframe access product technology. Advanced protocol conversion boxes. Communications boards. And powerful support software.

So we can help you connect virtually any ASCII device to an IBM mainframe with greater performance, less cost and positive security.

For complete technical information on PCI-Link and our full range of protocol converters, call Ron Ockander, VP Marketing, at 1 (800) 423-5904. Or just send the coupon.

Your DP nightmares are over.



With PCI-Link hardware and software your PC becomes a smart, multi-task workstation that gives you the power of IBM 3270 communications—plus more special features.

microcomputer, public network or LAN—simultaneously. You can even view and compare data from different sources in up to four windows.

Result? A multi-task workstation that combines the power of IBM 3270 communications with the intelligence of the PC. Plus complete file transfer capability.

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I want to wake up from the DP nightmare. Please send me my free "The End of the DP Nightmare" kit today.

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Telephone \_\_\_\_\_

**PCI** PROTOCOL  
COMPUTERS, INC.



## Meet to aim at business telecom

WASHINGTON, D.C. — A one-day seminar, "Optimizing Multinational Business Telecommunications," is scheduled for Oct. 24 at the University Club of Washington here.

The seminar will discuss how multinational companies can optimize their telecommunication facilities. Issues planned to be addressed include foreign regulations and data-flow barriers.

Hugh Donaghy, vice-president of industry relations at Control Data Corp. and chairman of the U.S. State Department's Business Advisory Committee on Transborder Data Flow, is one of the scheduled speakers.

Joining Donaghy will be Delbert Smith, an attorney specializing in international satellite communications law; Edward Regan, vice-president of telecommunications, operations and regulation at Manufacturers Hanover Trust Co.; and G. Russell Pipe, president of Transnational Data Reporting Service, Inc.

The registration fee is \$75, and more information is available from Transnational Data Reporting Service, Inc., P.O. Box 2039, Springfield, Va. 22152.

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# NIGHTMARE.

## NEWS



## MANAGERS ON THE MOVE

Armco Information Resources Management has announced the following promotions: **GEORGE H. HOMAN** has been named manager of telecommunications, and **DONALD R. MALARKEY** has been named manager of strategic planning, measurement and technology. **JOSEPH J. OSWALD** has been named manager of security, quality assurance and data management, and **PHILIP N. ADAMS** has been named manager of productivity and quality improvement. **ROBERT M. JOHNSON** has been appointed manager of training and development. Armco Information Resources Management is located in Middletown, Ohio.

Homan will be responsible for planning, development and coordination of voice and data networks throughout Armco. He joined Armco in 1961 at the Middletown Works. Homan was named manager of Armco's regional computer center for industrial and systems engineering in 1976 and became manager of management support systems for corporate human resources in 1979.

In 1981 he was named manager of operations and services, corporate information resources management.

Homan is a graduate of Miami University with a bachelor's degree in industrial technology.

Malarkey will develop planning and measurement methods and will coordinate the information of new technologies at Armco.

He joined Armco in 1960 at the Butler Works in Pennsylvania. At the Middletown general office, he has been manager of information resources management administration.

Malarkey graduated from Pennsylvania State University with a bachelor's degree in industrial engineering. He also has a bachelor's degree in education from Edinboro College in Pennsylvania.

Oswald will be responsible for computer security, quality assurance and data management functions and will also be in charge of planning and developing high-quality computer systems.

He joined Armco at the Middletown Works as a programmer in 1966. He moved to the Middletown general office as a staff systems engineer in 1973.

After moving to Bellefonte Insurance in 1980 as assistant vice-president of business systems, he became vice-president of production and systems in 1982.

Oswald graduated from the University of Cincinnati with a bachelor's degree in management science and

with a master's degree in quantitative analysis.

Adams joined Armco in 1964 as a research technician. He transferred to the Ashland Works in Kentucky as a senior industrial engineer in 1972.

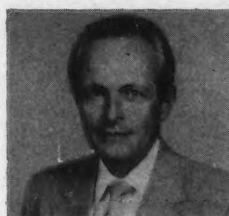
In 1978 he became manager of process and technical computing for corporate industrial engineering. Adams was appointed program manager of corporate productivity and quality in 1981.

He is a graduate of the

University of Dayton with a bachelor's degree in mathematics.

Johnson will be responsible for education and professional development programs for information resources management.

He joined Armco in 1957 at the Baltimore Works in Maryland. He was named manager of systems development for industrial and systems engineering in Middletown in 1976. In 1982, he was appointed manager of



Faucheaux

planning and control for corporate information resources

management.

Johnson graduated from Loyola College in Baltimore with a bachelor's degree in mathematics.

Harte-Hanks Communications, Inc. has announced the following promotions in its Information Services Department: **HOMER J. FAUCHEAUX** was named corporate director of systems procurement services. **BRUCE FLORY** was named corporate director of busi-

## CALIFORNIA BUSINESS ON THE MOVE.



**How the leading edge of communications technology can help sharpen your company's competitive edge.**

**Pacific Bell presents two of the most important new breakthroughs in the field of communications technology: Fiber Optic Services\* and the Digital Termination System.\*\***

Both are a part of the growing Pacific Bell Network of Services.

Both have been developed to provide greater access to the information resources your management needs to make faster, more profitable decisions.

And both can be strategic elements in turning your company's long-range goals into present-day realities.

**FIBER OPTIC SERVICES: The world's most advanced concept in communications.**

Imagine being able to transfer all your information at the speed of light.

With Fiber Optic Services, you can. Because fiber optics is the fastest communications

system available today.

Your messages are actually fired through hair-thin fibers of optical glass on light pulses generated by a laser or LED. At rates of up to one billion pulses per second.

A single fiber can transfer the complete contents of two-hundred standard-size books in one second flat.

Working for you, that same fiber will accommodate:

- ultra high-speed computer-to-computer messages
- videotext transmissions
- full motion video
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**Simultaneously.** From 6.3 MBPS to an incredible 405 MBPS.

As a result, Fiber Optic Services give you greater teleconferencing capabilities than you would have believed possible. Until now.

And because Fiber Optic Services combine revolutionary call carrying capacity with speed-of-light delivery, they dramatically reduce





## NEWS

ness information services. JAMES R. STEELE has been named corporate director of networking processing services.

Faucheaux will be responsible for supporting all company divisions and the corporate office in hardware capacity planning and the purchasing of computer hardware and software.

He previously worked for Datapoint Corp. as manager of user documentation and for City Public Service as



Flory

production scheduler.

Faucheaux joined Harte-

Hanks in 1979 and has been manager of computer hardware evaluation for the past year. Before that, he was in charge of the corporate data center.

Flory will be responsible for systems and programming for the company's newspapers and cable television operations. He also heads the department's Pathfinders group and coordinates information systems planning for Harte-Hanks. He joined the company in March



Steele

1983 as manager of newspaper systems. Before that, he

was product marketing manager for Intel Corp. in Austin, Texas.

Flory attended the University of Texas, majoring in computer science.

Steele will be responsible for overseeing the technical support group and computer operations at the corporate office and for managing the companywide data communications network now being developed.

He joined Harte-Hanks in July 1983 as manager of the corporate data center.

Before that, he was with Bendix Corp. as operations manager of the corporate data center in Ann Arbor, Mich.

Steele has a bachelor's degree in management from Oakland University and has done graduate work toward a master's of business administration from Eastern Michigan University.

Harte-Hanks operates in 29 states. The company owns and operates 27 daily newspapers and 75 non-daily publications, including weekly newspapers, advertising publications produced by newspapers and a trade publication for the radio industry.

WILLIS A. LEBOURVEAU has been appointed director of information systems for ITT Avionics Division in Nutley, N.J. In his new position, he will be responsible for operations and commercial data processing activities for ITT Avionics, including systems development, programming and operations and information services planning and development.

Previously, he was director of data processing for the Lederle Laboratories Division of American Cyanamid Co. for 10 years.

He most recently was director of information services for Reichhold Chemicals for two years, with corporate responsibility for all data processing, voice and data communications and office automation activities.

LeBourveau holds a B.S. and an M.S. in mechanical engineering from Princeton University.

Following graduation, he was an instructor in the Princeton University School of Engineering for two years.

ITT Avionics Division is a high-technology military defense contractor specializing

See MANAGERS page 50

your per-message transfer costs.

More benefits? Certainly.

**Freedom from system overload.**

A half-inch bundle of optical fibers will carry up to 240,000 conversations at once.

**Immunity to environmental interference.**

Bad weather, radio signals, and power lines will not garble your transmissions or cause costly delays.

**Highest security.** No one can tap your line of communication without immediate detection. Or listen in on your transmissions with an outside receiver.

**High space efficiency.** Fiber optic cable is about one-sixth the size of conventional cables of comparable capacity. And it weighs nearly 100 times less. Which makes installation easy and flexible.

Together, benefits like these make Fiber Optic Services an unprecedented solution to virtually all of your business communications needs.

**THE DIGITAL TERMINATION SYSTEM: A fast, efficient new communications link to your company's local market and to all of the business opportunities in it.**

If your company can call New York in less than a minute, but has trouble getting a message across town, you're probably losing business — and money — without even realizing it. Simply because of a weak communications link with the wealth of business prospects at your doorstep.

Fortunately, the solution is easy, affordable, and available today from Pacific Bell.

It's the Digital Termination System, an advanced microwave-based system created especially to meet your company's needs for high volume, high speed data transmission within your local market.

The Digital Termination System transmits videotext messages, graphics, freeze frame video, and computer data by microwave from your location to a signal relay point near you, and then on to a destination you specify — within a ten mile radius — that is equipped to receive the microwave signals.

Your messages are transferred with a combination of speed, efficiency and accuracy that no conventional system can match. Annoying, time consuming complications are eliminated.

What's more, the Digital Termination System gives you other important advantages, such as:

- A flexible bit speed that allows equipment to support virtually any synchronous transmission speed from 2.4 KBPS to 56 KBPS.
- Extremely low error rates — about 1 per 100 million bits of information.
- High quality facsimile and graphics transmission.
- Outstanding versatility. New services can be brought on line quickly and easily.

And right now, the Digital Termination System could be just the missing link your company needs to capture the local business

opportunities it's missing with its present system.

**Which of these new high-performance systems will do the most for your business? This SPECIAL OFFER will help you decide.**

Mail the coupon below, and we will arrange for a Pacific Bell specialist to give you a **FREE EVALUATION** of your present and future business communications requirements. Plus specific examples of how Fiber Optic Services and the Digital Termination System can help you bring your company's long-range goals closer to today. And there's no obligation. For immediate service, call toll free, **1-800-622-0735, Ext. 280.**

NOTE: Service availability is limited. Please call for details.

\*Fiber Optic Services are provided pursuant to a special assembly services tariff filing.

\*\*The Digital Termination System is available pending regulatory approval from the FCC and CPUC.

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(312) 566-9116



## NEWS

**MANAGERS** from page 49  
in electronic self-protection systems for tactical and strategic aircraft and advanced command and control communication systems for tactical forces.

STEVE GRANT has been promoted to manager of data services, MIS, at Zurich-American Insurance Cos. In his new position, he will direct the ongoing development of systems that provide management with the data necessary to make key business decisions.

Grant joined Zurich-American as a business systems analyst in 1981. He was promoted to assistant manager of data services, management reporting, in 1982 and became assistant manager of data services, corporate systems, earlier this year.

He graduated with a degree in business administration from Western Illinois University.

RODEINA DAVIS has been appointed vice-president/associate director of the data processing division for the Bowery Savings Bank in New York.

Davis joined Bowery Savings in 1973 as an associate systems analyst and has since held various positions within the DP division. These included systems analyst, senior systems analyst and project manager.

She became an assistant vice-president in 1981. During the past three years, Davis has served as quality assurance manager and more recently as data center services manager in the DP division of Bowery Savings Bank.

Davis graduated from California

Polytechnic University and received a bachelor of science degree in mathematics. She most recently completed a graduate program in computer science at New York University.

GARY E. MAURER has been appointed manager of corporate business information systems in the management information services department at Allentown, Pa.-based Air Products and Chemicals, Inc.

In his new position, Maurer will be responsible for the development and support of information systems for the company's corporate staff departments and support the corporate

systems requirements of the company's operating groups. Maurer joined Air Products in 1968.

He holds a B.A. degree in natural sciences from Kutztown University and an MBA from Lehigh University. Air Products and Chemicals is an international supplier of industrial gases and equipment, chemicals and engineering services.



Maurer

RICARDO A. DIAZ has been appointed vice-president of manufacturing programs on the corporate staff for Harris Corp. in Melbourne, Fla. He will be responsible for the enhancement of all aspects of Harris' manufacturing operations in the U.S. and abroad.

Prior to joining Harris, Diaz worked with a broad range of clients in manufacturing technology and general management consulting assignments.

Before that he spent 10 years with Westinghouse Electric Corp. as an electronic design engineer and senior project manager.

Diaz graduated from the Catholic University of Cordoba, Argentina, with a degree in electronic engineering. He subsequently received master's degrees in electrical engineering and in management from the University of Pittsburgh.

PAUL M. LEMERISE will join the Anaheim, Calif.-based division of Carter Hawley Hale Stores, Inc.'s Information Services Division as divisional vice-president in charge of office systems.

Most recently, Lemerise was director of information and technical services at Petro-Lewis Corp. in Denver, where he was responsible for office automation and data base administration.

Lemerise received his B.A. from Boston College and began his data processing career 18 years ago at Raytheon Co.

## Introducing. Software for the operations manager.

### The automated DOS/VSE data center.

It's Corodale's new  
System Scheduler. A better  
way to log, schedule and  
monitor processing activity.

System Scheduler  
organizes the data center.  
Eliminates no runs, misruns  
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Your savings.

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Boston Massachusetts  
02110

Telex 710-3216747



## SIS Workbook lists seminars

NEW YORK — Seminar Information Service (SIS) has announced publication of a guide to more than 3,200 business and technical seminars and workshops around the country.

This fourth edition of the SIS Workbook includes sections on DP, communications, minicomputer- and microcomputer-related topics, general management and organization development among others.

The SIS Workbook is broken into three separate sections: seminars listed alphabetically by topic, organizations sponsoring the seminars and a calendar of seminars that covers the period from October 1984 through March 1985.

The price of the SIS Workbook is \$195, which includes a monthly supplemental newsletter.

Additional information is available from SIS, which is located at Suite 3141, 175 Fifth Ave., New York, N.Y. 10010.

# DOS TO MVS

## CA-CONVERTOR™

### THE COMPLETE SYSTEM FOR TRUE CONVERSION AUTOMATICALLY

The best software conversion system will take you from DOS to MVS with less pain, greater speed, and the most savings. It's CA-CONVERTOR.

It will convert DOS JCL to MVS JCL. *Automatically.* It will convert DOS programs to MVS programs. *Automatically.* And it will create complete MVS documentation. *Automatically.*

CA-CONVERTOR will manage the migration process. It starts by inventorying and cataloging every DOS program. *Automatically,* you'll discover programs long forgotten and no longer needed. It provides up-to-the-minute reports throughout the process. *Automatically,* you retain control.

CA-CONVERTOR delivers true MVS conversion, not emulation for which you pay forever in higher-cost requirements and extra machine time.

With CA-CONVERTOR, you pay only for what you use—a piece at a time—and when you're finished using, you're finished paying.

CA-CONVERTOR, formerly known as FOCUS, is now available from Computer Associates. It's been proven in hundreds of the most effective conversions ever made. So now, Computer Associates provides even more software solutions—for the worlds of DOS and MVS and the migration between. For a free DOS to MVS Conversion Handbook or further information, call (800) 645-3003 or in-NY (516) 333-6700 and ask for Dana Williams.

#### WHAT WE BELIEVE

AS THE MOST DIVERSIFIED SYSTEMS SOFTWARE COMPANY  
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INSTALLED IN MORE DATA CENTERS—WE, COMPUTER ASSOCIATES,  
BELIEVE WE ALONE CAN SATISFY ALL OF A CLIENT'S NEEDS.



**COMPUTER ASSOCIATES**

Software Leadership Through Excellence

## NEWS

# Mini saves emergency center \$250,000 annually

GLENVIEW, Ill. — When Jim Clausen gets a call at his post at the Regional Emergency Dispatch (RED) Center here, he immediately has a variety of information available that will help him contact an emergency vehicle in about 20 seconds and send it to an emergency site in one of seven Chicago suburbs.

"That's down from about

45 seconds before we computerized the system," Clausen said.

He and another dispatcher, Tom Chiero, are responsible during their shift for getting the closest possible vehicle to a site where the situation may indeed be a matter of life or death.

Using a VDT, Clausen can immediately determine a

number of things that will help get the vehicle to the site faster: where the call came from, what kind of building or structure to look for and whether the street runs north and south or east and west.

The system already has preselected the closest appropriate vehicle to the site, regardless of which suburb it

might be in. If the closest vehicle is tied up on another call, the system already has a second and third choice available on a priority basis.

But the town of Glenview has not always had the computing power necessary to perform such on-line dispatching. Four years ago, the town was using an IBM System/3 computer with punch

cards to perform municipal data processing functions. When that system was no longer able to handle the town's volume of processing needs quickly enough, officials went looking for another system.

According to Dennis Lauer, finance director for Glenview, the town evaluated alternative systems from five vendors. Lauer conceded, however, that he was partial to MAI/Basic Four Information Systems, Inc. hardware because he had experience with it at a former job. In addition, he had gained some familiarity with software programs for municipal applications that run on Basic Four hardware.

## Heart of system

The town finally selected Basic Four's System 710 minicomputer as the heart of its system. Over the past several years, Glenview has expanded the system with Basic Four equipment to include three 75M-byte disk drives, nine VDTs, three multifunction display terminals, four letter-quality printers, two serial-character printers and Basic Four's Dataword word processing program. An application package for municipal functions from A. E. Klawitter and Associates, Inc. of Glenview provides programs for the fire, police, public works, finance and administration, building and zoning departments.

Lauer said the hardware/software combinations have saved the affluent North Shore Chicago suburb more than \$250,000 annually. He said Glenview's coffers have increased \$45,000 each year from the more efficient collection and processing of annual vehicle registration revenues.

The Dataword system displays the village code, saving Glenview an estimated \$12,000 annually in printing and updating costs; automatic accounting functions have added another \$44,000 in savings, largely by reducing the accounting staff from 13 to 11 persons, Lauer said.

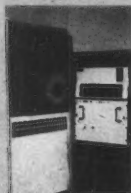
Payroll processing costs have been reduced by \$8,000 annually, and an escrow control savings of \$22,000 has been realized because the system provides a closer management of cash flow, he said.

Those figures do not include Glenview's contribution to the regional RED Center, which Lauer said saves the town an estimated \$100,000 each year.

"Each fire department used to have approximately eight dispatchers to handle emergency calls," he said. "Now it takes eight dispatchers to run the system for all seven departments."

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## NEWS



## CALENDAR

## WEEK OF OCT. 14

OCTOBER 14-16, CHICAGO — **National Retail Payment Systems Conference.** Contact: Interfinancial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925

OCTOBER 15-16, NORTH FALMOUTH, MASS. — '84 Seybold Executive Forum. Contact: Cheryl Paton McManamy, Seybold Publications, Inc., Suite 612, 148 State St., Boston, Mass. 02109.

OCTOBER 15-16, ORLANDO, FLA. — **Expert Systems Seminar.** Contact: TTS Seminars, Department EXS, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

OCTOBER 15-16, CHICAGO — **Tape Library Management Seminar.** Contact: TLC Tape Library Consulting, 3 Rock Royal Road, Yardville, N.J. 08620. Also being held Oct. 18-19 in Dallas.

OCTOBER 15-17, ANAHEIM, CALIF. — **The Fourth Annual Teleconferencing Users Conference.** Contact: Applied Business Telecommunications, Box 5106, San Ramon, Calif. 94583.

OCTOBER 15-17, CHICAGO — **Introduction to Data Communications.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

OCTOBER 15-17, SAN DIEGO — **Pervasiveness — Its Time is Here.** Contact: Jewel Peyton, Dataquest, Inc., 1290 Ridder Park Drive, San Jose, Calif. 95131.

OCTOBER 15-17, CHARLOTTE, N.C. — **Society for Computer Applications in Engineering, Planning and Architecture (Cepa), Inc. Fall Conference.** Contact: Patricia C. Johnson, Cepa, 358 Hungerford Drive, Rockville, Md. 20850.

OCTOBER 15-17, NEW YORK — **Technology Opportunity Conference.** Contact: Technology Opportunity Conference, P.O. Box 14817, San Francisco, Calif. 94114.

OCTOBER 15-17, WASHINGTON, D.C. — **Decision Support Systems: New Directions in Management Support.** Contact: U.S. Professional Development Institute, Department ABCD, 1620 Elton Road, Silver Spring, Md. 20903.

OCTOBER 15-19, NEW YORK — **Data Base for Experienced Designers.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., No. 405, 2800 N. Loop W., Houston, Texas. 77092.

OCTOBER 15-19, NEW YORK — **CICS Command-Level Programming.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 15-19, SAN FRANCISCO — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., No. 405, 2800 N. Loop W., Houston, Texas 77092.

OCTOBER 16-17, FRAMINGHAM, MASS. — **New England Association for Information and Image Management Equipment Show.** Contact: Herbert Whiffen, Micrographic Systems, Braintree, Mass. 02184.

OCTOBER 16-17, NEW YORK — **Integrating the Mainframe and the Micro in the Corporate Environment.** Contact: Institute for Advanced Technology, Suite 108, 1483

Santa Monica Blvd. Santa Monica, Calif. 90404.

OCTOBER 16-18, SAN JOSE, CALIF. — **The West Coast Electronic Office Expo & Conference.** Contact: Cartledge & Associates, Inc., Suite 205, 4030 Moorpark Ave., San Jose, Calif. 95117.

OCTOBER 16-18, NEW YORK — **Unix Operating System Exposition & Conference.** Contact: Robert P. Birkfeld, National Expositions Co., 14 W. 40th St., New York, N.Y. 10018.

OCTOBER 16-19, LONG ISLAND, N.Y. — **Implementing Local-Area Networks.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

OCTOBER 17-18, CHICAGO — **IBM Data Base Strategies.** Contact: Software Institute of America, 8

Windsor St., Andover, Mass. 01810.

OCTOBER 17-19, VANCOUVER, B.C. — **Data Communications — A Complete Overview and Update.** Contact: Douglas Grube, Data-Tech Institute, P.O. Box 569, 386 Franklin Ave., Nutley, N.J. 07110.

OCTOBER 17-21, CHICAGO — **National Office Products Association's 1984 Convention and Exhibit.** Contact: National Office Products Association's Convention Department, 301 North St., Alexandria, Va. 22314.

OCTOBER 18, NEW YORK — **Information Resource Management: Executive Briefing.** Contact: Research & Planning, Inc., 215 First St., Cambridge, Mass. 02142.

OCTOBER 18, ARLINGTON, VA. — **First Annual Information Resources Management Seminar.** Contact: Informatics General Corp., Suite

4705, 1776 E. Jefferson St., Rockville, Md. 20852.

OCTOBER 18-19, WASHINGTON, D.C. — **Software Verification and Validation.** Contact: Education Foundation of the Data Processing Management Association, Department SVV, P.O. Box 3608, Torrance, Calif. 90510.

OCTOBER 18-19, WEST ORANGE, N.J. — **Personal Computing Workshop for Executives.** Contact: Information Center Services, Inc., 1111 E. Putnam Ave., Riverside, Conn. 06878. Also being held Oct. 24-25 in Westport, Conn., and Oct. 29-30 in Boston.

OCTOBER 18-19, WASHINGTON, D.C. — **Datacom Network: Design & Planning.** Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960. Also being  
See OCT. page 54

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held Oct. 22-23 in San Francisco.

**OCTOBER 19, BURBANK, CALIF.** — Overview for Developers, Designers and Managers. Contact: IMS Consulting, Inc., 16530 Ventura Blvd., Encino, Calif. 91436.

**WEEK OF OCT. 21**

**OCTOBER 21-24, TORONTO** — National Retail Merchants Association Retail Systems Technology & Communication Conference. Contact: National Retail Merchants Association, 100 W. 31 St., New York, N.Y. 10001.

**OCTOBER 21-24, MIAMI** — International Data Corp.'s 1984 Fall Executive Conference. Contact: Diane Testa, International Data Corp., 5 Speen St., Framingham, Mass. 01701.

**OCTOBER 22, SADDLE BROOK, N.J.** — Dealing with Vendors & Suppliers. Contact: Performance Seminar Group, 11 Commerce St., Norwalk, Conn. 06850.

**OCTOBER 22-24, ATLANTA** — Fundamentals of Data Communications. Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

**OCTOBER 22-26, NEW YORK** — Structured Analysis & Design Techniques. Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

**OCTOBER 22-23, CHICAGO** — Software Tools for Distributed Decision Support Systems. Contact: Software Tools Conference, Suffolk University, Boston, Mass. 02108. Also being held Oct. 28-29 in San Francisco.

**OCTOBER 22-24, WASHINGTON, D.C.** — Oxford Software International User Group Meeting. Contact: User Group Co-ordinator, Oxford Software Corp., 174 Blvd., Hasbrouck Heights, N.J. 07604.

**OCTOBER 22-24, LOS ANGELES** — International Computer Negotiations Third-Party Leasing Seminar. Contact: International Computer Negotiations, Suite 1707, 200 St. Andrews Blvd., Winter Park, Fla. 32792.

**OCTOBER 22-24, BROOKLYN, N.Y.** — Applications of Microcomputers. Contact: Dr. C. Yapijakis, International Society for Mini and Microcomputers Symposium, School of Engineering, Pratt Institute, Brooklyn, N.Y. 11205.

**OCTOBER 22-25, WASHINGTON, D.C.** — Software Development and Maintenance in the Federal Government. Contact: U.S. Pro-

fessional Development Institute, Software Development in Government, 1620 Elton Road, Silver Spring, Md. 20903.

**OCTOBER 22-26, WASHINGTON, D.C.** — How to Develop an Effective Long-Range Data Processing Plan. Contact: Dr. Robert Keston, Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

**OCTOBER 22-26, NEW YORK** — Application Programming. Contact: Sysed,

Inc., 35 W. 35th St., New York, N.Y. 10001.

**OCTOBER 22-26, BURBANK, CALIF.** — Application Development. Contact: IMS Consulting, Inc., 16530 Ventura Blvd., Encino, Calif. 91436.

**OCTOBER 23, HASBROUCK HEIGHTS, N.J.** — Service Management Seminar and Trade Show. Contact: Mike Urban, Global Ultimacc, 4 North St., Waldwick, N.J. 07463.

**OCTOBER 23, NEW**

**YORK** — T-1 Carrier Strategies: The New Networking Imperative. Contact: The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

**OCTOBER 23-24, BOSTON** — Information Centers. Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

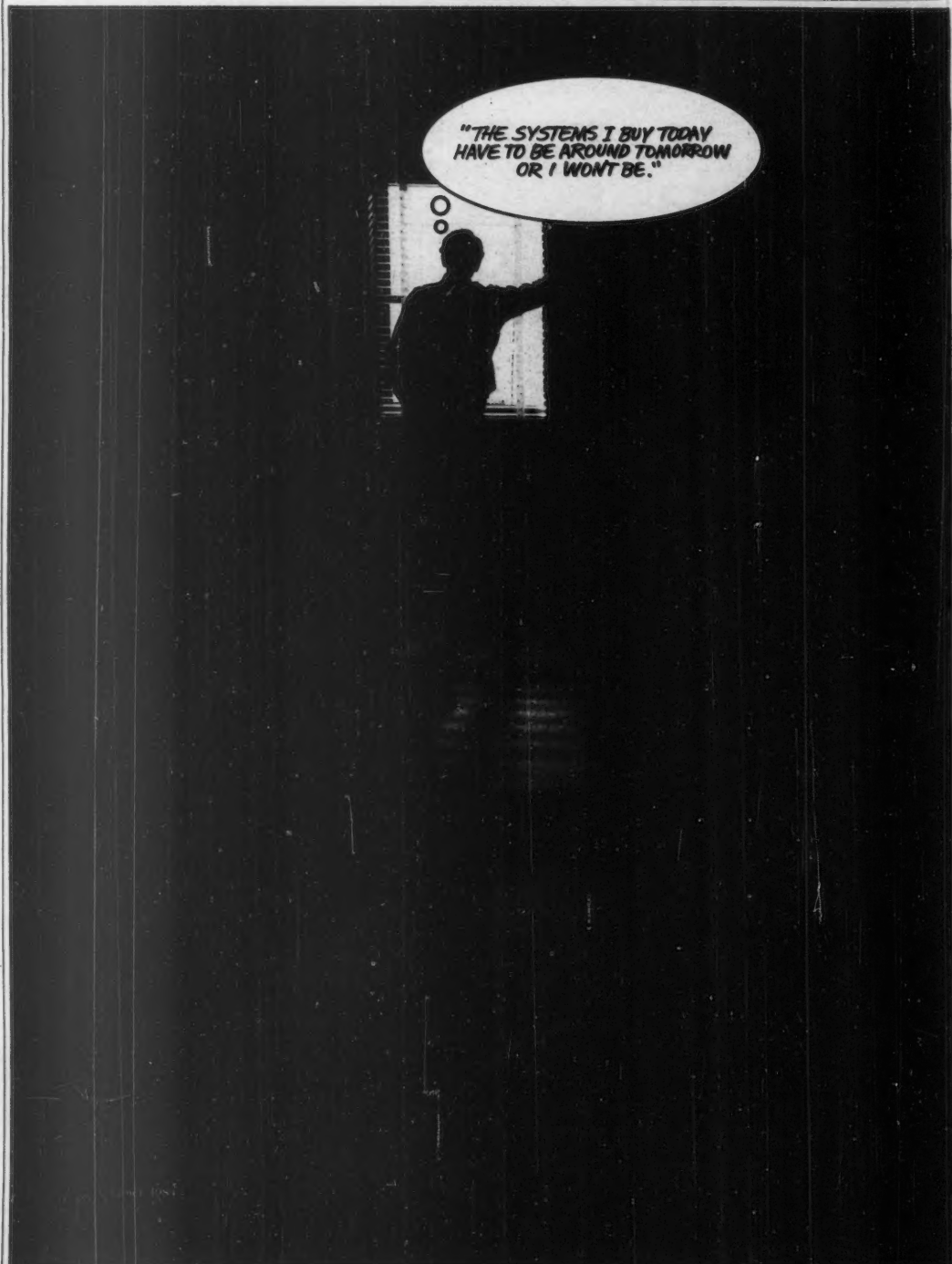
**OCTOBER 23-25, LOS ANGELES** — Decision Support Systems. Contact: Software Institute of America, 8 Windsor St., Andover, Mass.

01810.

**OCTOBER 24-25, NEW YORK** — IBM vs. AT&T: Round One. Contact: Marilyn Chasteen, The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

**OCTOBER 23-25, WASHINGTON, D.C.** — Selecting a Local-Area Network. Contact: Marketing Manager, Technology Concepts, Inc., Old County Road, Sudbury, Mass. 01776.

**OCTOBER 24-26, BOSTON** — Experts on Net-



## NEWS

works. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 24-26, CHICAGO — Implementing and Managing Information Centers. Contact: American Management Associates, P.O. Box 319, Saranac Lake, N.Y. 12983.

OCTOBER 24-26, ST. LOUIS — Software Quality Assurance Seminar. Contact: Gilbert & Associates, 10812 Olive Road, St. Louis,

Mo. 63141.

OCTOBER 24-26, WASHINGTON, D.C. — Equal Access: Lessons Learned in Charlestown, Minneapolis and Other Equal-Access Markets. Contact: Telestrategies, Inc., Box 874, 6842 Elm St., McLean, Va. 22101.

OCTOBER 25-26, ATLANTA — The Sixth Annual Atlanta High-Technology Venture Capital Conference. Contact: Betty Parker, Department of Continuing Education, Georgia Institute

of Technology, Atlanta, Ga. 30332.

OCTOBER 25-26, BOSTON — How to Plan and Utilize Your Voice System. Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

OCTOBER 25-30, COLOGNE, WEST GERMANY — Orgatechnik Cologne '84: Fifth International Office Trade Fair. Contact: Messe- und Ausstellungs-Ges.m.b.H. Köln, Postfach 21 07 60, 5000 Cologne, West Germany 21.

OCTOBER 26, NEW YORK — Automating the Not-for-Profit Sector. Contact: Center for Management, Box 520, 17 Lexington Ave., New York, N.Y. 10010.

OCTOBER 26, BOSTON — Ergonomics. Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

## WEEK OF OCT. 28

OCTOBER 29-30, SAN

FRANCISCO — Future Trends & Opportunities: The Next Five Years in Telecommunications & Microcomputers. Contact: Creative Strategies International, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

OCTOBER 29-31, WASHINGTON, D.C. — Strategic Planning for Telecommunications. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 29-31, WASHINGTON, D.C. — Testing Computer Software: Producing Defect-Free Systems at Minimal Cost. Contact: U.S. Professional Development Institute, Testing Computer Software, 1620 Elton Road, Silver Spring, Md. 20903.

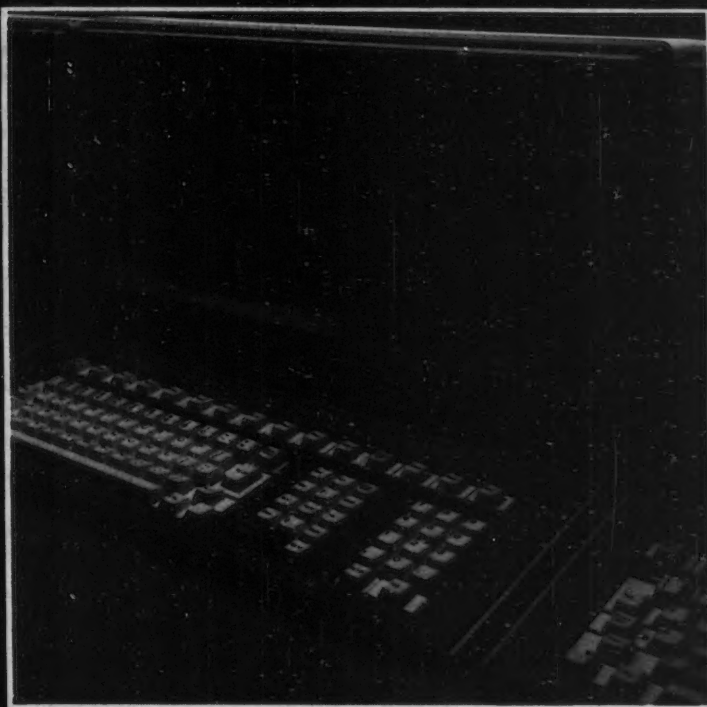
OCTOBER 29-31, LOS ANGELES — Financial Information Systems — Integrating Personal Computers. Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

OCTOBER 29-NOVEMBER 2, NEW YORK — CICS Macro-Level Programming. Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 29-NOVEMBER 2, ORLANDO, FLA. — IDMS-DC Programming Workshop. Contact: Steve Harris, Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

OCTOBER 29-NOVEMBER 2, WASHINGTON, D.C. — Comparative Data Base Management Systems. Contact: Chip Blouin, George Washington University, Washington, D.C. 20052.

OCTOBER 29-NOVEMBER 2, WASHINGTON, D.C. — Microcomputer Application Workshop: Evaluating Microcomputers Software Packages. Contact: Chip Blouin, George Washington University, Washington, D.C. 20052.



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# EDITORIAL

## Calling it quits — again

Control Data Corp. has bailed out of the IBM plug-compatible peripheral market, a withdrawal that comes only three years after the company abandoned the IBM plug-compatible mainframe business.

While analysts generally applauded the company's decision late last month to end what one termed "a big headache for them," users of CDC products have no more reason to cheer now than they did in 1981 when CDC dropped its Omega line of plug-compatible machines.

It had been known for some time that CDC was having problems with its big 33800 disk drive. Though the company never specified the exact nature of those problems, CDC did acknowledge the drives suffered from technical difficulties and manufacturing inconsistencies which caused some of the handful of 33800 users to experience head crashes. Whatever the reason, the company announced Sept. 20 that production schedules would again be cut back [CW, Oct. 1]. Developmental problems had already put the 33800 two years behind its original shipping schedule, probably at tremendous financial cost.

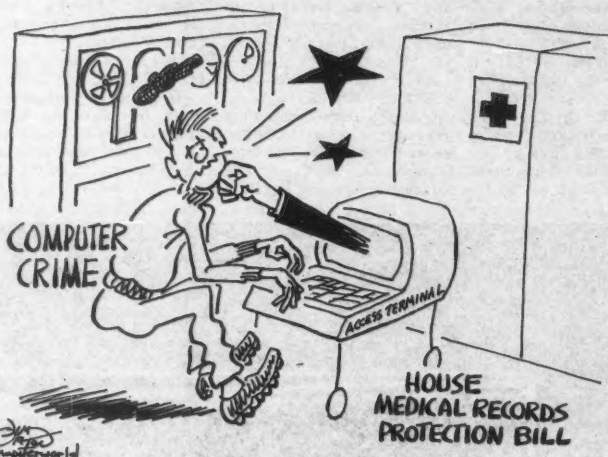
The final kicker came one week later when CDC said it would not only stop production of the 33800, but also that it would quit making all IBM plug-compatible peripheral equipment by next year. The decision affects products compatible with IBM's 3380 and the older 3370-, 3375- and 3350-compatible disk drives — products which contribute \$100-\$150 million a year to CDC's \$1.4 billion peripherals business. The company will continue to manufacture high-performance drives and peripherals for the OEM market.

The CDC announcement is one more in a string of similar decisions by plug-compatible manufacturers who have found it increasingly difficult to compete against IBM and therefore opt out. The reasons are not hard to find. Plug-compatible products require huge sums of research and development money, but no PCM can match the deep R&D pockets of IBM.

In addition, the life cycle of IBM mainframes and peripherals is clearly growing shorter. Products that used to last five years, now last three. For PCMs, this shorter product life cycle means they have less time to recoup their R&D investment — especially in the face of the aggressive pricing tactics IBM has employed since the resolution of the Justice Department's 13-year antitrust case.

CDC's write-off of the plug-compatible market may bolster the company's financial picture, but it also considerably reduces options for users of large IBM systems who prefer to buy some of their peripherals from someone other than IBM. Those options now are two: Storage Technology Corp. and Memorex Corp.

Now, as in 1981, CDC's decision is understandable — and regrettable.



## LETTERS

### Science trailing theology

I would like to take exception to a statement made in an In-Depth article by Norman L. Wilson Jr. In the article titled "Who should pay for a program error?" [CW, Sept. 17], Mr. Wilson made the following statement: "The law, like theology, is lagging behind the sciences." I do not question Mr. Wilson's comment about the law. However I do disagree with his comment about theology. Theology is the study of God, who created all things. Science is the study of all things created. The study of the Creator is not lagging behind the study of the creation, on the contrary — since many people who study the creation miss the Creator, I would have to say the opposite is true.

Daniel Thomas  
Fountain Valley, Calif.

### Software standards do exist

In "Who should pay for a program error?" [CW, Sept. 17], it is emphasized that "There are no industry standards by which a computer company can be judged." This is incorrect.

Among the four existing American National Standards Institute (Ansi) software standards are two of particular relevance to program error. These are Ansi/IEEE Std. 730/1981 IEEE Standard for Software Quality Assurance Plans and Ansi/IEEE Std. 729-1983 IEEE Standard for Software Test Documentation.

The Software Engineering Standards Subcommittee of the Technical Committee on Software Engineering of the Institute of Electrical and Electronic Engineers (IEEE) Computer Society See LETTER page 60

## COMPUTERWORLD

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CW Edition/Seminar, Computer Business and Commodore Magazine; Italy's Computerworld Italia; Japan's Computerworld Japan and Perso ComWorld; Mexico's Computerworld Mexico and ComputMundo; Netherlands's Computerworld Benelux and Micro Info; Norway's Computerworld Norge and MikroData; Saudi Arabia's Saudi Computerworld; Spain's Computerworld Espana and Micro Sistemas; Sweden's ComputerSweden; Mikro Delim, Min Handler and Svenska PC World; the UK's Computer Management, Computer News and Computer Business Europe; the U.S.'s Computerworld, Hot CoCo, InCider, InfoWorld, MacWorld, Micro Marketworld, Microcomputing, PC World, Run, 73 Magazine and 80 Micro.

# VIEWPOINT

## Connections



**LECHT  
ON SCIENCE**  
Charles P. Lecht

**T**here will be an increase in the "connections" problems that have plagued our computer industry since its beginning. These arise through the actions of one company to produce hardware and/or software that may be installed on the product of another's without the latter's consent. Doing so can erupt in warfare between the companies involved, especially if the latter believes its patent or copyrights have been violated.

In part, increases in these problems will quite naturally occur, as does the marketplace demand for computer systems of every conceivable size. In part, it will result from our inclinations to tie increasing numbers of new systems products into networks to facilitate their usefulness. But the computer industry's merger with and entry into the communications mart will be the major cause. Along with the benefits this may bring will be the latter's connections problems that historically have made our industry's pale by comparison.

Not that our's have been miniscule; we have only to remember the various suits and counter-suits arising because of intentional or accidental connections which tried the patience of the involved parties. For example, arguments over which company may create peripherals for another's systems or even write software have plagued our industry since its beginning. But our merger with the communications industry with whom we, as a group, also wrestled over the same issues, cannot help but exacerbate these problems.

The communications industry's long-standing

tradition of fighting and winning these suits went unabated for almost seventy years as its former giant, AT&T, took on just about anyone daring to enter the communications business. From arguing over trivia like the "hush-a-phone" connection to issues of substance like whether anyone operating a private mobile phone service should be allowed to connect to its networks, AT&T joins our comput-

*The communications industry's tradition of fighting and winning these suits went unabated for almost seventy years as its former giant, AT&T, took on anyone daring to enter the business. AT&T joins our computer industry as a battle-scarred and dismembered veteran of the courts.*

er industry as a battle-scarred and dismembered veteran of the courts. When push comes to shove in our continuing battle over which company may produce products to connect to another's, their years of experience in dealing with such problems should compound ours which, as I said earlier, aren't miniscule. To AT&T, "foreign" never meant abroad; it meant everyone else.

The smaller manufacturers of computer hardware and software systems alike will find it tough sledding for the remaining half of this decade in an environment which, by my reckoning, has at least two superpowers where previously there was but one. If the small firms are not adopted by one of these giants or bought outright, they will have to discover new methods of creating their products

and purveying these into or alongside the ever-spreading networks of the superpowers.

"Connections are everything," a wise businessman once said, and who are we to argue? Nowhere will this have more meaning than in our future computer industry, as its leaders busily create their massive integrated services digital networks through which the products and services of others may find life — along with their own, of course. "Without connections, you're nowhere," a New York cabbie recently told me. I think he meant that all the powers that computer systems may offer, and then some, will be dispensed like telephone service, Muzak or electricity. And, that the economies of scale we can expect from this could so lower the cost of computer systems power that new entrants into the computer business may vanish before they arrive unless they are well-connected.

It's inconceivable that anyone would want this to happen in view of our increasing dependence on high technology for survival. No matter how tempting the idea that the big companies might want it, I don't think this will prove to be the case. Economic history has shown that without the competitive struggle of our smaller industries the larger ones stagnate or come under governmental control. British history highlights the principle.

These days, there is little time and even less patience with the idea that the creation of such all-engulfing facilities by private industry should be prevented. We just deregulated our entire communications industry and our computer industry was never regulated in the first place. Bringing the two together has provided us with an industry worth over \$200 billion — roughly twice the size of AT&T before it was broken up because it was too big. But the jury is still out debating who will dominate the newly combined industry; as far as I'm concerned, there is a chance that neither of its current leaders will ever be able to succeed — nor may anyone else for some time to come. Of course the mind boggles with the idea of AT&T merging with IBM or one buying the other, but we won't see MERGE page 58

*Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.*

## IBM software announcement: fuel for speculation



**HUMAN  
CONNECTION**  
Jack Stone

**W**here are all those analysts now, those who predicted that IBM would never be a significant factor in the personal computer business because they can never get themselves organized to produce acceptable personal computer software? I suspect they are out of the country nurturing their bruised egos, now that IBM has announced its internally developed software to the micro market (CW, Oct. 1).

The announcement reveals much about IBM's direction — or at least it provides more fuel for speculation in this regard. Here are my swings at guessing what IBM is up to now. Let's start with the issue of the strategy of "open architecture," that is, appraising independent software firms of the internal design detail of the personal computer so as to enable them to write applications programs for the micro operating environment.

IBM is not the kind of company to change its policies easily, so you can imagine the wringing of hands and the wrenching of souls that went on when the company decided on such heretical action. I suggest the reasons for this decision were

these: First, IBM saw that the limitations of the then current technology restricted not only the size of programs and data files to levels below those needed for a decent-size, but small business market, but more significantly, the ability to fully integrate such systems into comprehensive but unannounced configurations of micros, minis and mainframes for the large corporation market. Second, the internal struggles involved with trying to choose an operating system which was compatible with the major IBM product lines, yet was not too far away from the thrust of the market at that time, namely CP/M, must have been legion.

Even more complex must have been the debates over what applications software to develop and the degree of their generality. It is no secret that IBM's software has traditionally been ponderous, which may be minimally acceptable if there are 16M bytes of random-access memory (RAM) for the tasks to wallow around in, but it's quite a different story if the task has a noose around the neck in the form of 64K bytes of RAM or 128K bytes of RAM at best.

So the product czar, I suggest, made the decision not to decide at all, but to bypass this development cycle, let the software entrepreneur in for the play, use a CP/M derivative as an operating system so as not to shock the pants off the current user base, sell machines like crazy by virtue of marketing presence and relax until: a) the software circus settles down on the most practical general-purpose packages of application programs; and b) improved, faster hardware is developed with the internal capabilities for microprocessor sharing, micro-mainframe links, local-area networks and all

the other good things that are important to a total systems approach — a basic IBM strategy.

### Special advantages

This decision had several special advantages:

- IBM gave 3,000-odd software competitors a multi-year head start, an action that would have to blunt any criticism by the Department of Justice boys when and if it ever did announce internally developed software.

- It bought time for IBM to study, reflect and determine just exactly what is the best hardware and software combination for the marketplace, one which is consistent and integrative into plans for the standard product line.

Well, the hardware showed up in the form of the IBM Personal Computer AT and the software specifications became clear: IBM look-alikes for Lotus Development Corp.'s 1-2-3, Ashton-Tate's Dbase II and III and Peachtree Software, Inc.'s Accounting Packages, but designed to accommodate IBM plans for future expansion, not possible with the independent packages. No doubt the first-generation releases of these packages will be higher priced than the competition, not a great loss for IBM whose share of the market will ultimately be only 75% of the software market instead of its heaven-committed 95%.

So the personal computer independents have a new and formidable competitor, king of the castle, IBM. And not just the software types either. The personal computer cloners may also join the worried generation if IBM rigs its software with gadgets to restrict its operation to machines only of its manufacture.

*Stone is an independent management consultant, educator and writer, specializing in DP human communications and personnel development, based in Washington, D.C.*



## VIEWPOINT

**MERGE** from page 57

even assign this the probability we might, say, to the merger of the USSR with the U.S.

But what to do to ensure the health of our smaller computer and communications companies as the larger ones sew their systems into ever larger networks isn't going to be an easy problem to solve. Governmental intervention the likes of which occurred in Europe isn't going

to provide the answer.

When the European Economic Community coerced IBM into providing advanced information on its new systems interfaces to drop its antitrust suit against the firm, it achieved for IBM what IBM itself could not, namely, destruction of the possibility of a homegrown alternative in computer systems. Pity the poor European engineer who we may now envision as sitting at his desk awaiting the latest care

package from Armonk so he can get on with designing something.

Our computer industry has thrived on individual initiative and a willingness to try to compete no matter how great the odds against success may seem. Steven Jobs and his Apple Computer, Inc. provided us with a shining example of this and winning, too.

**Incredible odds**

Wang Laboratories, Inc.,

Data General Corp., Digital Equipment Corp. and Prime Computer, Inc., to name but a few, rose to the occasion against incredible odds; the failure of such behemoths as General Electric Co. and RCA Corp. to create viable computer businesses during the same time period must have been nerve-racking. And Apollo Computer, Inc.'s ingenuity as a late entrant into the computer systems marketplace cannot help but give IBM and AT&T cause to wish

Apollo hadn't tried — or to wish they could buy the firm.

As I see it, the forces that made events such as these possible betrays a principle which has been operating in our computer industry since its beginning. While fiercely competitive, and not without all the shenanigans human frailty may provide, we have somehow known that certain kinds of self-imposed restraints in our overzealous drive to win should be put in place before we killed anyone's incentive to try.

That AT&T of late suffered for its reluctance to allow others to connect their devices is plain enough evidence of the folly of practicing exclusionary tactics, not that these weren't needed in the early years of its formation. With the emergence of our new computer-cum-communications industry, we have little need to enforce such exclusionary practices.

We can only hope that its current leaders will not wait for governmental intervention to recognize this and will take adequate measures to ensure that our smaller industries are not inadvertently killed off. Providing a means by which this can happen in an open, competitive way will mean leaving the issue of connectivity open to merit.

**Industry standards**

I don't think this will require self-adoption of the drastic measures forced upon IBM by the EEC. Nor do I think that doing this would be any healthier for our companies than I suggest it will be for those in Europe. What I do think is that getting together to create a set of industry standards, if only in the desktop/terminal area, would benefit everyone. In hardware, this needn't be more than a device controller standard — like the Small Computer Standard Interface — being prepared by a group of companies for consideration by Ansi or something like it.

In software, the choice of an operation systems standard interface for developers would go a long way toward ensuring their continued vitality.

In both cases, we needn't settle on just one; it's not knowing which ones or how many there may be that's cooling investor enthusiasm to finance our startup enterprises.

If such minimal standards at the terminal could be put into place, nothing of significance would be lost to the leaders of our new computer industry. For if their profitability materially depends on an avoidance of this when so much can be done in the massive systems to which these are to be connected and over which they have absolute control, they'll not succeed anyway.



### Engineers have used the computer to automate every industry but their own.

Software engineers have developed the technology to automate the secretarial world, banking, printing, defense systems, manufacturing, communications...even the Stock Exchange. But here we sit in the dark ages in our own industry, still documenting with pencil and paper, still manually assimilating, still groping with the ambiguities of translating the original idea into written form.

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### TECHNOLOGY FOR THE AUTOMATED GENERATION OF SYSTEMS



## VIEWPOINT

# Effective management strategies key to quality



**QUALITY**  
Wayne Smith

The Association of Computing Machinery has devoted its September issue of "Communications" to computing in space. There is an especially intriguing interview on the space shuttle primary computer system. The interview was conducted with several members of the software development team responsible for designing, building and maintaining the shuttle's primary avionics and software system. This is the software that actually flies the shuttle during ascent and reentry — or doesn't fly it, as the case has recently been.

At one point in the interview the team was asked whether the shuttle applications were written using data abstraction techniques. The answer was no. In fact, it was stated that it was unlikely that anything remotely close to modern data abstraction techniques would be found in the shuttle's computer system. Most of the design dates back to the late '60s

based mostly on anecdotal evidence. Certainly not repeatable, certainly not scientific.

The answer to this important question lies, again, back in the shuttle program. In that situation, it is clearly granted that individual productivity tools and methods could have been utilized. A data dictionary tool here and a test coverage analyzer there could have been employed and possibly achieved a corresponding local productivity and quality boost. But, the key issue was that these tools were not part of the management and organizational process. They had not become an integral part of the established software development culture. The tools and tech-

niques existed, people knew about them, but they hadn't yet become part of the process and discipline of building systems.

Quality, then, is less a function of the sum of the quality characteristics of the set of individual techniques in your program and more a function of the management and organizational process that will manage these techniques and control their usage. To say it another way, the quality characteristics that will be inherent in your own data processing products are not so much a result of the quality characteristics of the individual techniques that were employed to produce those data processing products. Rather, they are a result of the

management strategies and organizational principles that properly allocate those techniques to the appropriate organizational entities and schedule and control their usage so that they are brought to bear on the right work products and at the right time. This is the essence of a true quality program.

## MIS departments are critical link

We all feel confident that the new tools on the horizon and in recent use today have a great deal of promise. Quantification of their characteristics is, of course, still sorely needed. More precise definition of the dimensions of the productivity and quality

See **QUALITY** page 60

*To them (and to Nasa), quality was reliability; reliability was confidence; and confidence was history.*

and early '70s from the Apollo, Mercury and Gemini programs, together with software and hardware experience on more terrestrial flight control applications.

So, here we had the most advanced computer application in the world being implemented with old techniques, old hardware and old components. As you read the entire interview, you come away with a strong sense that these developers were clearly seasoned professionals, faced with innumerable trade-offs and enormous risks.

So why, in the face of the staggering proportions of the problem, did they choose to rely primarily on the techniques of the past. Upon reflection, the answer seems obvious: They had seen them work before, and they knew how to use them. To them (and to the National Aeronautics and Space Administration), quality was reliability, reliability was confidence, and confidence was history.

Given Nasa's position on this issue, then why should your MIS organization be any different? Why shouldn't your organization simply rely on the old methods of the past? This is an especially compelling question, when you realize that the newer techniques and their associated productivity and quality characteristics have so far eluded validation by a scientific method. The best the computing science community can do is provide highly intuitive arguments

Smith is vice-president, specializing in quality, at Applied Information Development, Inc. in Oak Brook, Ill.

*Mother of three.  
PTA Secretary.  
Saboteur.*

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## VIEWPOINT

**QUALITY** from page 59

factors are required. We can look to the universities and research and development organizations to advance our knowledge in this area.

Moreover, newer tools, better methods, and the continuing refinement of the existing techniques will likely come from many fronts, but primarily from the relevant vendors specializing in software quality and productivity.

But, in the final analysis, your MIS department remains the critical link. We must, therefore, adopt new tools and techniques.

This is not so much to gain the quality benefits they will certainly ultimately provide, or even to refine the techniques themselves, but rather to begin to shape the much more important management methods and

organizational principles which represent our only hope of exploiting them fully in the future.

You and your MIS organizations are the only crucible in which the successful quality programs can be hoped to be forged.

Without you as the critical link, the industry will be doomed to a progression of highly advanced, state-of-the-art, extremely esoteric tools and methods that can only fail to live up to their potential.

Established management skill and background is required to integrate them properly into the highly complex, environmentally dependent and high-flux MIS organizations.

As we learned from the shuttle program — quality is reliability, reliability is confidence, confidence is history; but history is being made now.

**LETTERS****Kudos for quality assurance**

In response to "Quality assurance needs support" [CW, Sept. 17], I think a more appropriate title for the article would have been "Quality assurance starts getting support," as evidenced by the phenomenal success of the Bay Area Quality Assurance Association and the growth of quality assurance as a function within the data processing industry.

The description you gave of the quality assurance job as mainly identifying poorly designed and coded software reinforces the negative im-

age of quality assurance [personnel] functioning merely as "programming police." A more accurate description of the quality assurance function would be to say that quality assurance provides the data processing department with the tools, methodologies, techniques and standards to build quality into software.

Marcia Senk  
San Francisco

**A challenge for Wooley**

I challenge Louisiana First Assistant Secretary of State, J. Robert Wooley, to back up his statement that "In the past . . . state and federal courts have split on the issue of whether the package's license agreement constitutes a binding contractual arrangement with the purchasers," [CW, Sept. 10].

I make this challenge because, to the best of my knowledge, there are no reported cases, at either the state or federal level, where a judge has ruled that a "tear open" license agreement on a mass market computer program constitutes a binding contract.

I am so sure of my position that if Mr. Wooley can provide me with a citation of one federal case and one state case reported in any computer law journal or by West Publishing Co., I will contribute \$50 to his favorite charity.

L.J. Kuttner  
St. Louis

**LETTER** from page 56

produced all of these Ansi standards and is working on 16 more. Among those under development is a standard for software unit testing that will be balloted during Nov. 1984.

At least two professional organizations are concerned with software engineering (the IEEE Computer Society and the Association for Computing Machinery) and both organizations are involved in standards development.

Software engineering has professional standards.

David Gelperin  
Golden Valley, Minn.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for the purposes of clarity and brevity.

Letters should be addressed to Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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another, fixed assets yet another. In actual use, these separate designs become separate walls. Barriers to problem-solving.

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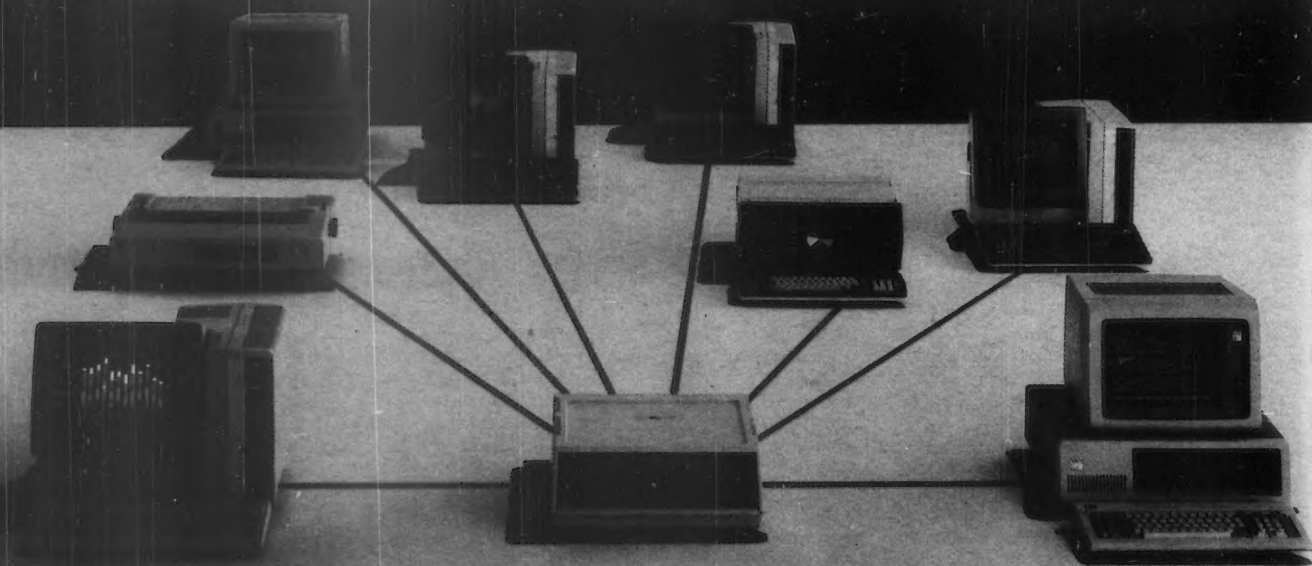
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# SOFTWARE & SERVICES

## A DBMS checklist for manufacturing systems

By Anne Proia  
Special to CW

Over a period of 10 years, manufacturing information systems have evolved to the point where it is now virtually impossible to implement the basic functions required without the use of a sophisticated data base management system (DBMS).

As a minimum requirement, a manufacturing information system is expected to provide a completely integrated set of production and inventory functions, handling everything from daily net-change material requirements planning (MRP) to the dispatching function on the shop floor. It is expected that all user departments will be able to access a single repository of manu-

facturing data that is available 24 hours a day. The basic manufacturing functions of MRP require the complex searching and

*MRP manufacturing functions require complex searching and summarization of vast amounts of data.*

summarization of vast data amounts.

The functions of manufacturing information systems thus require that the following five components exist in a DBMS:

1. **Bill of material processor.** The most basic requirement of any MRP system is that it be able to describe the subassemblies or raw materials that go into making

a manufactured item. The DBMS must not only "explode" the subassemblies downward but must also give upward visibility to higher level items on which these subassemblies are used. This is called implosion.

Chain-based DBMS implement this feature through complex chain structures relating the parent item to the component subassembly simultaneously in an upward and downward direction. This is termed a "many-to-many" relationship since a parent item can have many component subassemblies and may be used as a component subassembly on many other parent items.

In contrast, the relational DBMS handle this feature in a much simpler fashion. Two indexes are built on component subassembly records — explosion and implosion sequences.

The relational DBMS seem to perform better for on-line addition of bills of material in manufacturing environments where

See MRP page 81

Anne Proia is a data base consultant with Comserv, Inc., a vendor of manufacturing software. She specializes in multi-ple data base systems.

## Federal Express backs bold ad claims with DP

"When it absolutely, positively has to be there overnight," proclaim the ads for Federal Express Corp., the company that moves documents and packages overnight to any city in the U.S. and parts of Canada. This is a rather bold and daring claim when one considers all the possibilities for error or delay in a territory as large and as complex as the one that Federal Express handles. The logistics involved are overwhelming, the computer dependency — enormous. Yet, each day, Federal Express proves its claim.

To meet this daily challenge, Federal Express runs two IBM IMS production systems. The first, referred to as "Cosmos," supports customer service functions and is used primarily for courier dispatch and for rating and supporting the service agents who inform customers where their packages are and what the rates should be. The other system is a commercial IMS system supporting all other activities within the company, such as receivables, paya-

See EXPRESS page 84

## Ada overcoming market obstacles



SOFTALK  
John Gallant  
CW Senior Editor

As the demure Augusta Ada, the Countess of Lovelace, finally come out from behind her veil?

It appears, in a sense, that she has. Her namesake, the high-level programming language embraced for all mission-critical applications by the Department of Defense, seems to be leaping the hurdles that impeded its entrance into the commercial market quite handily of late. The major stumbling block, DOD validation of Ada compilers, has been hurdled by a growing number of companies in recent days. An even larger pool of vendors, many of them awaiting DOD validation of their compilers, has made available a variety of programming aids and tool kits as an interim market strategy.

In the last few weeks alone, these pages have seen the introduction of two additional Telesoft, Inc. validated compilers for Motorola, Inc. 68000 microproces-

sors and the AT&T Unix operating system. In addition, Digital Equipment Corp. unveiled its own validated compiler for its VAX-11 processors; Data General Corp. announced a debugging tool that completed its DOD-defined Minimum Ada Programming Support Environment; Veridix Corp. introduced its Ada Development system for large-scale embedded systems; and Intermetrics, Inc. unwrapped its Byron/Ada PDL Toolset.

It has become fashionable these days to lay the scourge to the defense establishment for the huge cost overruns and the procurement scandals that have afflicted that government sector. But when it comes to the birth and development of Ada, one must give credit where credit is due. Admitting to the huge maintenance and applications incompatibility problems it was facing, the DOD bit the bullet and took on the task of designing a programming language to meet its needs. Perhaps more important, the DOD implemented and stuck by its strict Ada certification procedures to ensure the development of a truly portable, standard language.

See ADA page 82

■ Cipherlink Corp. unwrapped its Any Data-bridge, facilitating data transfer between a variety of computers/64

■ Universal Software, Inc. announced its Universal-Link intermachine communications software/64

■ Data General Corp. unveiled an Ada debugging tool for its Eclipse/MV superminis/64

■ Management and Computer Services, Inc. enhanced its Promacs/CICS and Estimacs packages/65

■ Teledyne Brown Engineering Co. will distribute Telesoft, Inc.'s Ada compiler for Apollo Computer, Inc. workstations/65

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## Stratus adopts Oracle's relational DBMS across entire system line

MARLBORO, Mass. — Stratus Computer, Inc. has announced the availability of Oracle Corp.'s Oracle relational data base management system (DBMS) across the entire line of its Stratus continuous processing systems.

According to a spokesman, the Oracle relational DBMS on Stratus computers appears to the user as a series of tables called relations. The user encounters no other data structures, and information is reportedly presented in a simple, easily learned format. Oracle also provides a nonprocedural relational query language called SQL-Plus, based on IBM's SQL.

Supporting all user levels for interactive, transaction and batch processing, SQL-Plus is a query, data manipulation and definition and data control language. In addition, Oracle's application generator reportedly tailors screens for on-line data entry, query and update procedures without programming. The system's interactive report writer allows the output of any query to be automatically formatted into a report, the vendor said.

The integrated data dictionary can be accessed through all Oracle facilities. All Oracle applications develop-

See STRATUS page 84

## Software International unwraps IDMS-based general ledger tool

ANDOVER, Mass. — Software International Corp. has announced a Cullinet Software, Inc. IDMS-based version of its General Ledger & Financial Reporting system. The software runs on IBM mainframes under IBM's OS or DOS.

According to a spokesman, IDMS installations will be able to utilize ADS/On-Line, Cullinet's application development language, to develop in-house programs that can interface with the Software International system. In addition, IDMS utilities and report writers will be able to access data resident in the General Ledger & Financial Reporting system, accord-

ing to Software International.

The package includes on-line ledger inquiry at the summary or detail level, mass maintenance capabilities and an on-line recurring and standard journal entry facility. System security and audit control features are built in to ensure data integrity, the vendor said.

The price of the IDMS-based General Ledger & Financial Reporting system is \$103,900 for OS and \$95,800 for DOS.

More information on the system is available from Software International, which is located at One Technology Drive, Andover, Mass. 01810.



## SOFTWARE &amp; SERVICES

## Cipherlink introduces data bridge

LOS ANGELES — Cipherlink Corp. has announced the Any Databridge, which reportedly allows users to transfer data between applications and a variety of machine types.

According to a spokesman, the Any Databridge can transfer data stored in different programs on the same computer or between minicomputers, microcomputers and mainframes without rekeying. The system uses the IBM Personal Computer XT as an intermediate computer with two data ports to computers requiring the link.

The Any Databridge reportedly does not modify either the source or the target program, but acts as a translator between the two. It emulates a human operator to extract data from one program, strip it from its format and enter the data into another program. The spokesman said the Databridge product can translate data between any applications on any system in any direction. Neither the sender nor the receiver of data needs to be concerned with file structures, disk formats or languages because Any Databridge achieves compatibility on the applications level.

The Any Databridge is installed on a computer functioning as a front-end data processor and is positioned logically between two computers. A single computer functions as both source and target when the product is used to move data between two software packages stored on the same computer. A terminal port is required to make a connection to the system. Cipherlink offers the Any Interface Card to provide terminal ports where necessary.

The Any Databridge is priced at \$15,000, including training and installation. For further information, Cipherlink is located on the Eighth Floor, 3807 Wilshire Blvd., Los Angeles, Calif. 90010.

## DG unveils Ada debugging tool

WESTBORO, Mass. — Data General Corp. has announced an interactive, source-level Ada language debugging tool for its Eclipse/MV line.

With the addition of the Ada Development Environment (ADE) Source-Level Debugger, DG becomes the first vendor to offer a complete Minimum Ada Programming Support Environment tool set for Ada, as defined by the Department of Defense. The debugger and associated DG tools are said to increase programmer productivity and minimize the costs associated with program development, testing and maintenance.

The ADE Source-Level Debugger is priced at \$7,000 for an initial license and \$5,000 for subsequent licenses. Availability is 30 days after receipt of order from the Technical Products Division of DG, 4400 Computer Drive, Westboro, Mass. 01580.

## CPU, remote device link introduced

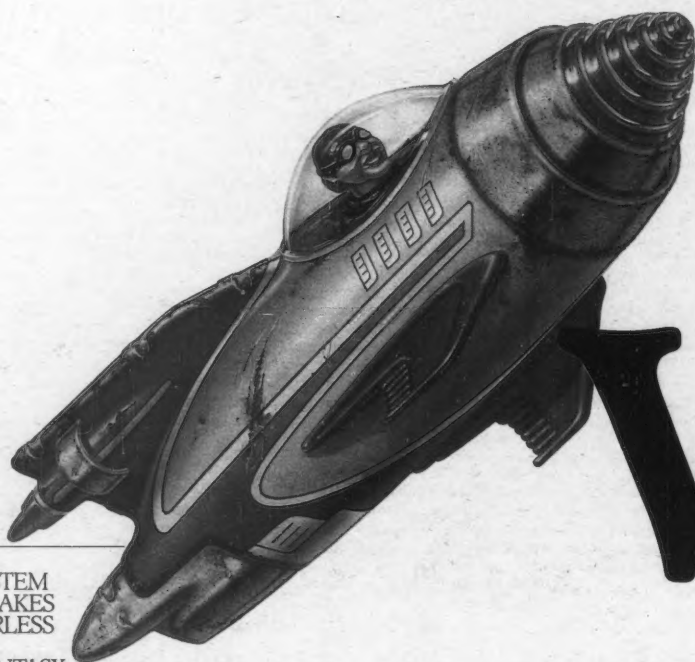
BROOKFIELD, Conn. — Universal Software, Inc. has announced Universal-Link, a communications software system that enables users to communicate between IBM mainframes and most types of remote computers.

According to a spokesman, Universal-Link operates under IBM's DOS/VS(E) and OS/MVS operating systems and facilitates communications among mainframes, minicomputers, microcomputers, word processing equipment, point-of-sale terminals and other types of distributed equipment. It provides users with the capability to download and upload data between a central site and any number of remote terminals.

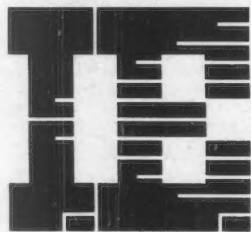
The spokesman said the product supports all binary synchronous and asynchronous terminals and can transmit data in Ascii or Ebcidic mode across any number of communications lines, either switched or leased. Other features include automatic error recovery and restart, data compression capabilities, blocked transmission and hard-copy reporting of transmission activity.

Universal-Link is said to be useful in a distributed data processing environment where continuous mainframe access is not required and data transmission is generally of short duration. It includes autodial and autoanswer facilities, and can be tailored by the user to automatically select the most cost-effective method of transmitting data to and from remote sites, the spokesman said.

The product is said to be a multitasking system that can support any number of communications lines concurrently. It supports a wide variety of terminals and equipment, including IBM's System/23 Datamaster; System/34, 36, 38 and 5280; 4321; and Displaywriter systems. It supports all bisynchronous terminals, such as IBM's 2780, 3780, 3741 and 3270, and it supports asynchronous transmission for the IBM Personal Computer and compatibles. Universal-Link is priced between \$8,000 and \$40,000, depending on user system configuration. Universal Software is located at Brookfield Office Park, Brookfield, Conn. 06804.



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Borderless. ■ You've heard the word enough. And until now, that's all it's been. A word. Not reality. ■ But Management Science America has changed that. ■ Meet I.E. The new mainframe software tool that gives you the level of system integration that some companies have been promising. But not delivering. ■ I.E. is truly borderless. ■ It removes the barriers between systems. Between the individual user and accounts receivable. And accounts payable. And general ledger. And more. So that the individual user can retrieve information and design reports from several application programs at once, even if they aren't all MSA programs. Simply and quickly. At one online terminal. ■ And I.E. is designed



## SOFTWARE &amp; SERVICES

## Promacs/CICS, Estimacs enhanced

### Datamacs, Tracmacs programs available for Burroughs systems

VALLEY FORGE, Pa. — Management and Computer Services, Inc. has announced enhancements to its Promacs/CICS and Estimacs software products. The company has also announced that its Datamacs and Tracmacs programs are available for medium- and large-scale Burroughs Corp. systems.

Promacs/CICS application development system for IBM mainframes under IBM's OS and DOS has been extended by an on-line screen generator called Paintmacs, which reportedly enables users to define formats or maps with a screen painter. The enhanced Promacs/CICS program sells for \$24,000.

A financial analysis module, improved effort, hardware portfolio and maintenance modules have been added to Estimacs, a mainframe software development estimating system. Estimacs supports the IBM Personal Computer and Personal Computer XT and Apple Comput-

er Corp.'s Apple II+ and Apple IIe, according to the vendor.

The financial analysis module treats systems work as an investment and analyzes expected cash flows in the system life cycle, the vendor said. It is said to include many financial calculations. Estimacs sells for \$15,000 for the first copy.

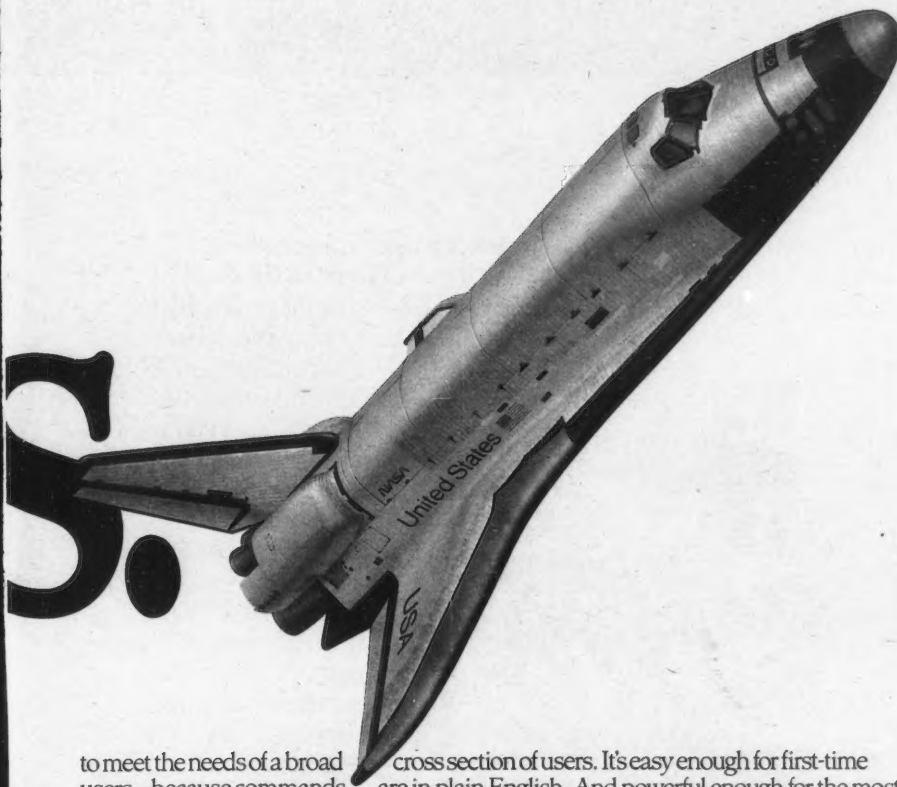
The Burroughs medium-scale version of Datamacs test data generator, coupled with the Tracmacs program path auditor testing and debugging software system, is said to provide all of the capabilities and characteristics of the software as it is currently marketed to Sperry Corp. and Honeywell, Inc.

Price of the system is \$26,000.

More information is available from Management and Computer Services, located at Great Valley Corporate Center, Valley Forge, Pa. 19482.

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to meet the needs of a broad cross section of users. It's easy enough for first-time users—because commands are in plain English. And powerful enough for the most advanced DP specialist. ■ And I.E. also gives you higher levels of security than most other systems. ■ Only MSA gives you I.E. ■ It's a giant technological step into the future from the company that has quietly led the way in application software development. It will now be a part of all software MSA provides. The result of 3½ years of intense research and development, it's the tool that has taken the concept of total "system integration" out of the realm of theory and into the realm of fact. ■ To find out more about I.E., contact Robert Carpenter at (404) 239-2000. ■ Management Science America, Inc., 3445 Peachtree Road, N.E., Atlanta, Georgia 30326. ■ I.E. from MSA. ■ It's one more way we're adding the genius to computers. ■ Today and tomorrow. ■

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## Ada compiler to be bundled on Domain line

WASHINGTON, D.C. — Apollo Computer, Inc. and Teledyne Brown Engineering Co. have announced that, through a cooperative agreement, Teledyne Brown will distribute and support Telesoft, Inc.'s Ada compiler for Apollo's Domain workstations.

An Apollo spokesman said the agreement with Teledyne Brown and San Diego-based Telesoft provides the first such Ada implementation for the Chelmsford, Mass., computer manufacturer's high-performance workstations which are designed for the scientific and engineering markets.

Official Department of Defense validation of the Teledyne Brown/Telesoft Ada compiler is currently under way, Apollo said. Initial purchasers of the package will receive a subset compiler, with a full upgrade provided when the validation is received later this year, the firm said. The subset compiler is priced at \$5,200.

Apollo is located at 330 Billerica Road, Chelmsford, Mass. 01824. Teledyne Brown Engineering is located at Cummings Research Park, Huntsville, Ala. 35807.

## SYSTEMS SOFTWARE

### RUBICON SYSTEMS, INC.

#### VM Sentry

Rubicon Systems, Inc. has announced a software package said to enhance the security of IBM's VM/SP.

According to the vendor, VMSentry complements IBM's directory maintenance package and provides a user-controlled password security with on-line password change support. Audit trails of password change attempts are maintained as an additional measure of protection. According to the company, once a password is changed, it is maintained by a VMSentry utility program executed in conjunction with the standard VM/SP directory maintenance products and procedures.

A permanent license for VMSentry is \$7000/CPU, including the first year of maintenance and enhancements. A two-year lease-purchase plan, annual maintenance plan and multifacility discounts are available.

Rubicon Systems, Suite 600, 1600 Wilson Blvd., Arlington, Va. 22209.

### ROBERT ELLIS ASSOCIATES

#### 7080 Simulator

Robert Ellis Associates has announced the 7080 Simulator, a software package that enables programs written in IBM 7080 code to run on any IBM 370-type system without an emulator.

According to a spokesman, the 7080 Simulator is a collection of PL/I modules that execute 7080 object code by simulating 7080 functions. The system's control cards reportedly relate internal file references to

Continued on page 68

# The Newest HP 3000.

It's the new, low-cost Series 37 Office Computer—the ideal system for a branch office, department or small business. Because in this little box comes all the power of an HP 3000 computer.

On the one hand, the HP Series 37 Office Computer can handle your distributed data processing needs, such as data entry and retrieval, data base management, accounting, even batch processing.

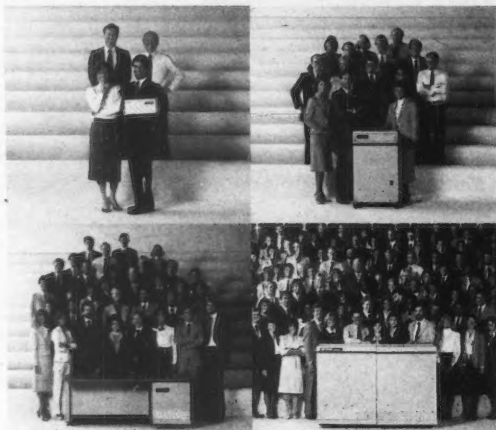
On the other hand, it does an extremely efficient job around the office. Just plug it into a regular power outlet, and it's ready to tackle a mountain of work, operating more quietly than a typewriter.

## **Integrated information improves productivity.**

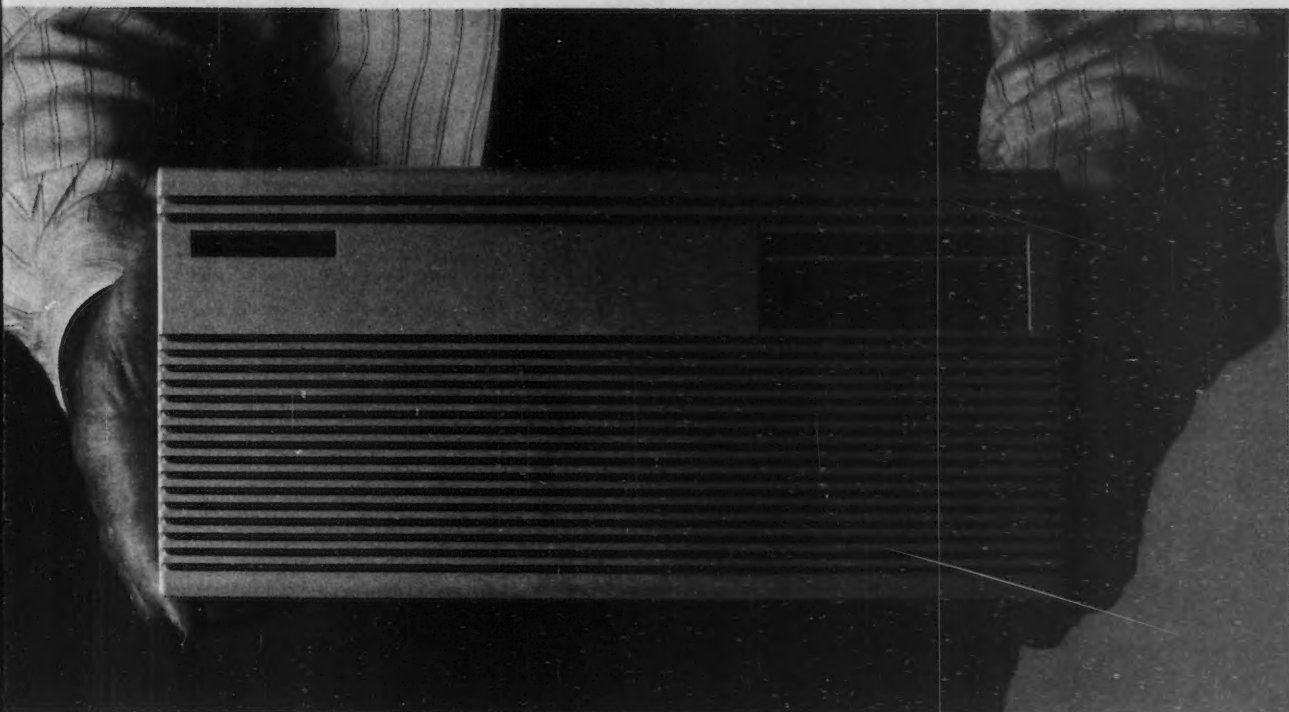
As the heart of HP's Personal Productivity Center, the Series 37 integrates all your office information needs. It provides a common interface for HP's Touch-screen Personal Computer and The Portable, as well as IBM PCs. Rather than just acting as "dumb" terminals, they can interact directly with the Office Computer, using simple personal computer commands.

You also get commu-

nications for electronic mail, links to your mainframes and other HP 3000s. Word processing. Graphics. Business software for financial planning. And



The HP 3000 family. These fully compatible business computers can take you from the Series 37 to a 400-user Series 68 distributed mainframe. Without any change in your software.



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hundreds of off-the-shelf programs.

This gives your people the individual tools they need to improve productivity. And with links to a common data base, they can be sure that the data they're working with is accurate and up-to-date.

### **Making it easy to change and grow.**

Most importantly, this is one small computer system that doesn't have to stay small. The Series 37 Office Computer can handle as few as two or as many as 28 users. And you can keep growing with the HP 3000 family right up to a system for 400.

When you're ready for more power, you simply unplug the peripherals, roll in the new HP 3000, turn it on and you're ready to go.

All family members are fully compatible right up the line. So the software you run on the Series 37 Office Computer will run on all the other models. Without any conversion at all.

With the Series 37, we're also big on service. In fact a Datapro poll rated us #1 in

support. That's no small compliment from our customers.

So if you want a single, integrated solution for both sides of your company, there's only one company to call: Hewlett-Packard. Contact your local HP office listed in the white pages. Or write to: Susan Curtis, Hewlett-Packard, Dept. 003205, 19055 Pruneridge Ave., Bldg. 46T, Cupertino, CA 95014.

In Europe, write Michael Zandwijken, Hewlett-Packard, Dept. 003205, P.O. Box 529, 1180 AM Amstelveen, The Netherlands.

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## SOFTWARE &amp; SERVICES

Continued from page 65  
external IBM JCL data dictionary statements, indicate alteration switch settings, define optimization parameters and provide additional optional facilities. To the operating system as well as to the computer operator, the simulator appears as a normal job requiring no special services, according to the vendor.

The 7080 Simulator is priced at \$125,000, the vendor said.

Robert Ellis Associates,

474 Hughes Road, King of Prussia, Pa. 19406.

#### BOOLE & BABBAGE, INC. Screenform Version 4.0.1.

Boole & Babbage, Inc. has released Version 4.0.1. of Screenform, an on-line tool for creating and maintaining IBM TSO, CICS and Information Management System screen formats.

The enhancements add IBM MVS/XA Interactive System Productivity Facility

support, field-level definition, on-line macro and copylib generation and a generalized application interface, Boole & Babbage said. The enhanced field-level definitions reportedly eliminate the need for supplemental formats used by prior versions of the product.

Screenform's I/O area generation has also been enhanced for PL/I and Cobol programs and now allows user specifications of group- and full-level numbers, ac-

cording to the vendor.

Screenform is priced at \$5,000 for a perpetual license.

Boole & Babbage, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

#### SCA PRODUCTS & SERVICES, INC. Data Manager

SCA Products & Services, Inc. has introduced Data Manager, an enhancement to SCA's Gateway integrated

operating environment that runs under IBM's VM/SP operating system.

Data Manager provides interactive screens for entering budgets, plans, schedules, forecasts and other business items, according to the vendor. A user reportedly can define fields in response to prompts, enter data and change or update files at any time. In conjunction with Gateway, Data Manager allows a user to create his own graphics and reporting applications that can use personal or corporate data bases, SCA said.

Data Manager is included in the cost of Gateway, which is priced at \$53,100.

SCA Products & Services, 353 Lexington Ave., New York, N.Y. 10016.

#### B I MOYLE ASSOCIATES, INC. Bimwndow

B I Moyle Associates, Inc. (BIM) has announced Bimwndow, said to provide windowing capability to users of IBM mainframes under IBM's DOS/VSE operating system with Vtvm.

Bimwndow is said to allow IBM 3270 terminals to switch back and forth between multiple Vtvm application sessions, with up to four concurrent sessions active. Typical uses of Bimwndow include logging on to a Vtvm application for testing while reviewing the source code for a program being tested on another Vtvm-connected application or using several system monitoring facilities concurrently.

A permanent license for Bimwndow is \$2,400.

B I Moyle Associates, 5788 Lincoln Drive, Minneapolis, Minn. 55436.

#### SOFTWARE CORP. OF AMERICA

Changetracker; Data Check Recovery Version 2.0; Fastdase Version 3.1

An automatic change tracking system and updates of two utility software packages have been announced by Software Corp. of America.

Changetracker is designed for load modules and supports IBM's OS. According to the company, the Changetracker records date, time, job name/user identification and other statistics, including an optional narrative describing the reason for the change. A query/display facility provides management with an historical perspective for solving change-related problems. The Changetracker is being offered at an introductory price of \$6,500, the vendor said.

Version 2.0 of Data Check Recovery incorporates new scanning and reporting features, including Scanlogree, which eliminates performance degradation caused by

Continued on page 70

# NO OTHER LETTER-QUALITY PRINTER CAN TOUCH OUR NEW SPINWRITER FOR SPEED AND EASE-OF-USE.

## Introducing the Spinwriter 8850.

Our newest, and fastest, Spinwriter® printer operates at over 550 words-per-minute. And is extraordinarily easy to operate.

For one thing the Spinwriter 8850 takes care of basic settings such as pitch and forms length automatically. Of course you can also change either

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With large, legible alphanumeric LED's to indicate the specific operating status.

And make it simple for even an unfamiliar operator to use.

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The first choice of IBM PC users.

The Spinwriter printer was the first totally plug compatible letter-quality

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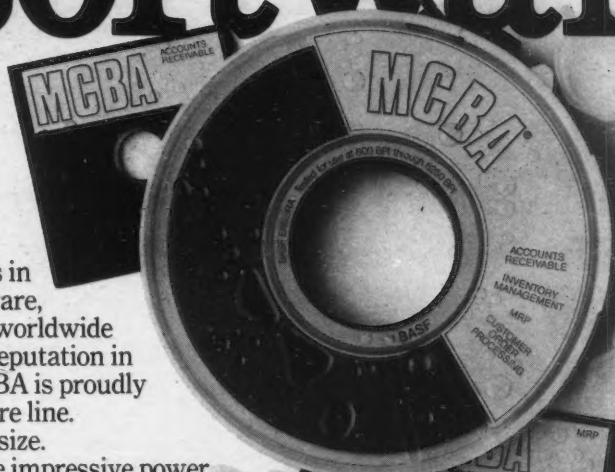
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## SOFTWARE &amp; SERVICES

## Continued from page 68

soft failures; a Nofix data checking option that allows the user to determine how a data check problem should be resolved; and a Skip Displacement Report that monitors a volume condition, according to the vendor. Site license for the software is \$5,900, or \$3,950 for a single CPU.

Vsam reporting and dual-density volume support are among the additions to Fastdase, a reorganization tool that recommends placing frequently accessed files close together. It supports all IBM OS systems and IBM 3330, 3350 and 3380 disk drives and plug-compatible devices.

Cost of the software is \$6,500 for one CPU and \$11,000 for two CPUs. A site license for three or more CPUs is \$15,000.

Software Corp. of America, 455 Cartledge Drive, Herndon, Va., 22070.

DESIGN STRATEGY CORP.  
Vsam Analyzer

Design Strategy Corp. has introduced Vsam Analyzer, a Vsam space analysis and performance tuning product for systems operating under IBM's DOS/VS, VSE, OS/VS1, MVS and XA environments.

Among the Vsam analyzer's features are the capacity to show space utilization of each cluster and to determine where deficiencies lie. The product is also said to provide parameters for reorganization of Vsam clusters.

Another feature of the analyzer is the ability to create the job control language to redefine Vsam clusters.

Vsam Analyzer is priced at \$2,500 for IBM DOS; \$3,500 for IBM OS.

Design Strategy, 330 Madison Ave., New York, N.Y. 10017.

SOFTWARE PURSUITS, INC.  
Spri

Software Pursuits, Inc. has introduced a printer spooling system for the IBM DOS/VSE operating system and the company's own MVT/VSE operating system.

Spri reportedly lets the user add space to spool queues while the spooler is active and permits sharing of spool queues between two or more CPUs.

Spri has its own command languages and processes all power commands. The system also offers backspace and forward-space reports by page number, line, number or character string, the company said. It also is said to print reports before the job ends and split large reports for printing based on form types, customer name, job name and job number.

Spri is available for \$300/mo or \$250/mo for a two-year lease.

Software Pursuits, Suite 800, 444 Market St., San Francisco, Calif. 94111.

SAS INSTITUTE, INC.  
Diltest procedure

SAS Institute, Inc. has introduced a procedure said to enhance the interactive capabilities of its SAS/IMS-DL/1 program by allowing SAS programmers and data base administrators to test data base calls in a full-screen, interactive mode.

The Diltest procedure is said to be a test facility similar to some IBM data base test utilities. Unlike those utilities, however, the procedure reportedly allows SAS users to test data base calls interactively. Users format a DL/1 call by filling in the fields on the Diltest screen and executing the call with a RUN command, the vendor said.

SAS/IMS-DL/1 software runs on IBM 370, 30 series and 4300 series, as well as compatible systems running under IBM's OS and DOS/VSE operating systems.

The Diltest procedure is available to SAS/IMS-DL/1 users at no additional fee.

SAS Institute, P.O. Box 8000, SAS Circle, Cary, N.C. 27511.

ADVANCED SYSTEMS  
CONCEPTS, INC.

Abstract/38; Probe/38

Advanced Systems Concepts, Inc. has announced enhancements to its documentation software that run on the IBM System/38 under IBM's CPF 6.0 operating system.

Abstract/38 is said to deliver documentation of a user's applications systems in printed format, and Probe/38 allows on-line accessing of that information. Enhancements include the ability to print out the representation of a display file. The display file layout option presents an image similar to IBM's Screen Design Aid utility.

Individual RPG or Cobol source programs can also be analyzed with the enhanced releases. An exploded source listing has also been added to Abstract/38. Probe/38 enhancements include the ability to display all programs referencing any portion of the physical or logical data base.

The products are available for \$1,000 each or together for \$1,400. Current user upgrades are \$30.

Advanced Systems Concepts, Suite S, 1950 Remington Road, Schaumburg, Ill. 60195.

## ZINK &amp; KATICH, INC.

Presto/38

Zink & Katich, Inc. has announced that its Presto file display utility for the IBM System/34 and System/36 has been expanded to support the IBM System/38.

Presto/38 reportedly allows CRT presentation of up to 266 character record segments for records as large as 4,079 bytes. It is also said to offer update, add and delete capabilities without setup work.

Its Interactive Debug Facility is said to allow programmers to view inside their programs to isolate problems.

Presto/38 is priced at \$875.

Zink & Katich, 1853 Bernice Road, Lansing, Ill. 60438.

See AIDS page 74

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We are sure that after reading it Tominy will make a believer out of you too.

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\*Tominy's completely portable application development system is presently available for IBM's PC, System/34, System/36, Series/1, 43XX, 30XX, 370XX, DEC VAX/VMS systems, UNIX and XENIX operating systems

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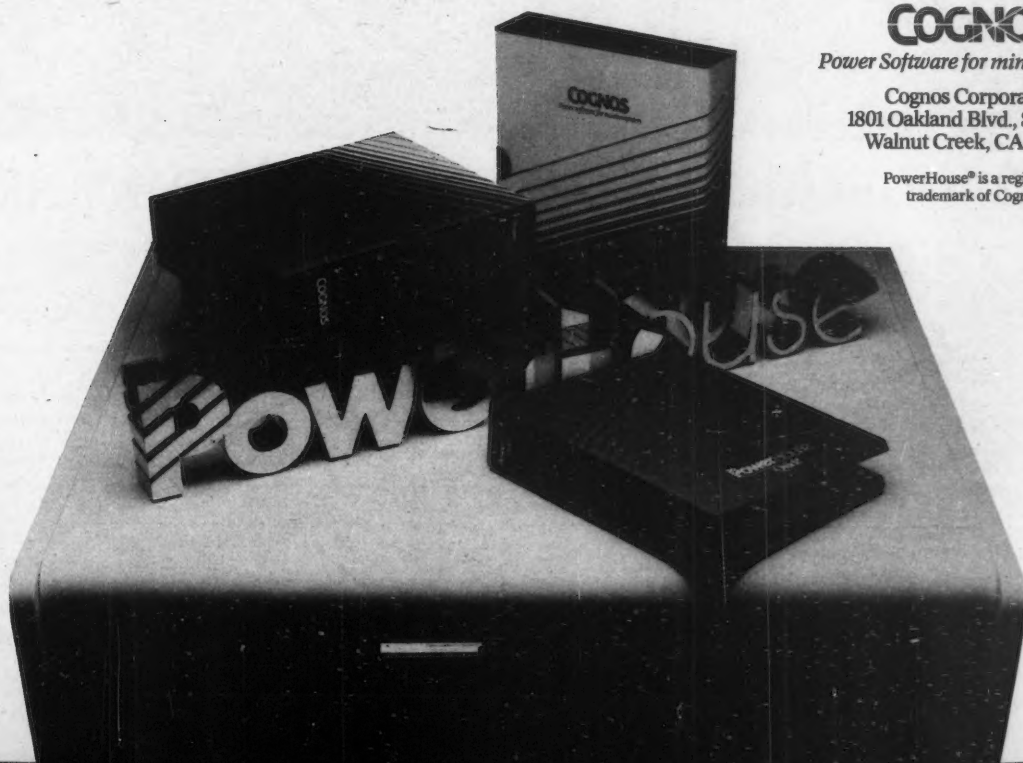
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WORKSHOP/204 does all this in a fourth generation environment. And because it's interactive and menu-driven, it's also easy-to-use.

If you want to get complete applications online 5 to 50 times faster, WORKSHOP/204 is the way to do it.

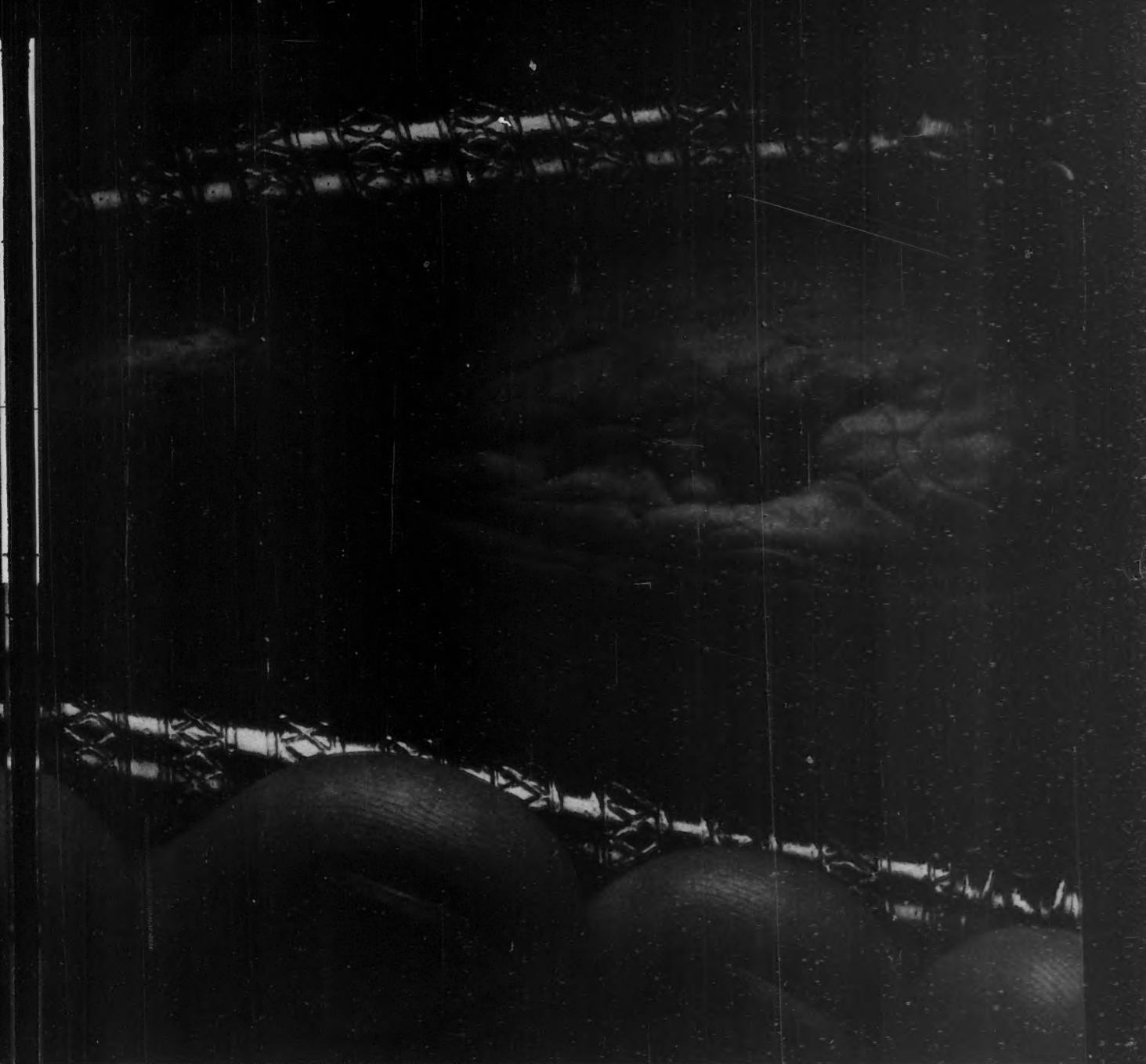
## **2. INTELLIGENT INFORMATION CENTER. An integrated system for giving executives access to the database.**

Business managers need useful informa-

tion, not meaningless data. The INTELLIGENT INFORMATION CENTER is a complete set of tools that allows them to get what they need themselves. Without having to understand anything about mainframe technology.

The INTELLIGENT INFORMATION CENTER includes an easy-to-use PC/mainframe link that downloads data and creates spreadsheets automatically. There's also a powerful, menu-driven query and reporting system and a completely automated application generator. Plus interfaces to tie into other decision support systems. And a utility to quickly load data from commercial databases to your own. In addition there's an administrative tool that controls data access and documentation.

The INTELLIGENT INFORMATION



## to today's three toughest MIS problems.

CENTER is the smart answer to automating corporate end-user computing needs.

**3. PROD/NET. The only OA system that can integrate PC's, word processors, LAN's and hosts using existing hardware.**

PROD/NET is the first and only system that lets you totally integrate office automation equipment and host computers into a single communications system. Using the hardware and technologies you already own.

No other product comes close to the completeness of PROD/NET. For one thing it lets you connect PC's into efficient local networks so they can communicate with each other, handle multi-tasking, and share expensive peripherals. It also allows documents to be translated automatically

from one type of word processor to another. And host-based SNA communication transfers data between host terminals, word processors and the PC networks.

PROD/NET can give everybody in the office direct access to the corporate database. Probably no investment you could make will make your company more efficient and effective.

**MODEL 204 DBMS. The kernel of a complete corporate information environment.**

CCA's relational MODEL 204 is the fastest growing DBMS for IBM mainframes. It gives you productivity with performance, plus ease-of-use, efficiency, flexibility and capacity. Qualities that make it the perfect foundation for your corporate information system.

**WORKSHOP/204.** The INTELLIGENT INFORMATION CENTER. PROD/NET. MODEL 204 DBMS. Only CCA offers the total solution to managing the corporate information environment.

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## Free seminar to help you manage the information crunch.

Attend one of CCA's free seminars listed below and you may be able to break out of your shell. You'll find out, for example, why time after time MODEL 204 DBMS is rated at the top for ease-of-use and high performance. You'll also see demonstrations of CCA's efficient new tools like WORKSHOP 204, that can help you cut your applications backlog, as well as THE INTELLIGENT INFORMATION CENTER and PROD/NET.

Select a seminar that fits your schedule and call 1-800-258-4100 today to reserve your place.

### CCA's Executive DBMS Seminar Schedule.

OCTOBER	
18 Albany	23 Tampa
18 Albuquerque	16 Toronto
11 Boise	23 Vancouver
25 Calgary	30 Washington D.C.
18 Cleveland	26 Winnipeg
4 Detroit	
10 Harrisburg	NOVEMBER
25 Houston	4 Albany
16 Kansas City	1 Anaheim
4 Little Rock	8 Boston
18 Los Angeles	28 Buffalo
2 Louisville	7 Chicago
23 Milwaukee	20 Columbia, S.C.
19 Montreal	15 Dallas
18 Ottawa	14 Denver
17 Philadelphia	15 Hartford
16 Pittsburgh	6 New York City
4 Phoenix	29 Rochester
23 Richmond	8 Seattle
9 Salt Lake City	
4 San Jose	DECEMBER
25 St. Louis	6 Oklahoma City

## Computer Corporation of America

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## AIDS from page 70

### GEORGIA STATE UNIVERSITY Spin-X

Georgia State University has announced a modification to the Sperry Corp. OS1100 operating system which allows Xerox Corp.'s 8700 and 9700 electronic printing systems to be channel-attached to Sperry 1100s.

The Spin-X software is installed on the Sperry 1100 computers and requires no hardware modifications to the computers or printers. A one-time license for Spin-X costs \$7,000 for a first site installation. Maintenance and new-release software support are included for the first year.

Georgia State University, University Plaza, Atlanta, Ga. 30303.

## PRODUCTIVITY AIDS

### THE BRIDGE, INC. Keyplus

The Bridge, Inc. has announced an on-line entry system that provides a direct link to the computer.

Keyplus operates directly with IBM's Vtm and is said to eliminate slow response time at the terminal. Editing and logic functions reportedly can detect errors and prompt the operator for corrections.

The system also provides backup and recovery facilities to protect against data loss. Coding and compiling is not required.

Developed by Infolink Australia Pty. Ltd., Keyplus' U.S. distribution rights had been given to The Bridge.

The product is priced at \$29,500 for the IBM DOS/VSE version and \$36,500 for the VSI and MVS version. Prices include two days of training, documentation and interactive facility, retrieve facility and logic facility options.

The Bridge, 199 California Drive, Millbrae, Calif. 94030.

### HONEYWELL, INC. Development Center

Honeywell, Inc. has announced the Development Center, a collection of software tools and services designed to improve data center productivity.

According to a spokesman, the Development Center is designed for its DPS 8 and DPS 88 computers operating under the Geos 8 operating system. Development Center products and services are divided into three categories which parallel the major areas of responsibility and activity in a data processing department: applications development, systems administration and operations support.

The applications development category includes tools to build Cobol-74 applications, tools for building transaction processing systems and a variety of general-purpose tools.

System administration offerings include tools for systems management and tools and services for analyzing and monitoring computer performance.

The spokesman said Honeywell marketing representatives will consult with customers on the selection of appropriate Development Center tools for particular tasks. The tools are priced separately and according to configuration.

Honeywell, P.O. Box 8000/A-79, Phoenix, Ariz. 85066.

## SOFTWARE & SERVICES

### HELP/38 SYSTEMS, INC. Print Coder

Help/38 Systems, Inc., a division of Advanced Circuits, Inc., has announced Print Coder, a design aid that gives IBM System/38 programmers a facility for creating print programs interactively.

According to a spokesman, Print Coder automatically writes the output source for each report or form as it is designed on the screen. The design aid works on new or old print programs, IBM's RPG output specifications or external print files, the vendor said.

Print Coder reportedly also provides complete documentation for each report, including information on who gets the report, when they receive it and where it is to be delivered. Various listings show report distribution by program name, location, department, individual and day of printing. Print Coder provides a library of all report programs, layouts and related information.

Print Coder is priced at \$985 per CPU.

Help/38 Systems, 15102 Minnetonka Industrial Road, Minnetonka, Minn. 55345.

### SYNTACTICS CORP. Crystalseries

Syntactics Corp. introduced Crystalseries, a Unix-based document management system designed for the multiuser market.

Crystalseries reportedly enables users of Unix-based microcomputers

and minicomputers to do word processing and generate business forms as well as perform related document management tasks. The initial release of Crystalseries will run on a variety of Unix-based systems, including those of AT&T, Altos Computer Systems, Inc. and Convergent Technologies, Inc. Crystalseries will also provide access to documents stored in the system, the firm said.

The software package is said to feature an object-based design, which reportedly allows users to modify and manipulate the object they are working on easily.

The system's document data base will support a range of document-handling facilities, including access to a relational data base management system and applications programs, the vendor said.

The initial release of the software is scheduled for the second quarter of 1985. It will be priced at \$2,500 for micro systems that support three to 16 users.

Syntactics, Suite 145, 3333 Bowlers Ave., Santa Clara, Calif. 95051.

## APPLICATION PACKAGES

### MANUFACTURING MANAGEMENT SYSTEMS Job Chaining System

Manufacturing Management Systems has announced a "full-pegging system" to identify at all bill of materials.

Continued on page 76

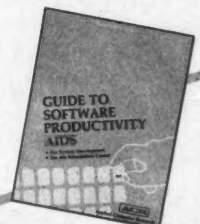
## GUIDE TO SOFTWARE PRODUCTIVITY AIDS

A directory of software tools available commercially that will help improve the productivity of your system development efforts.

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# THE 10 MOST IMPORTANT QUESTIONS YOU SHOULD ASK YOUR SOFTWARE VENDOR



*"Many questions you would ask prospective application software vendors don't differentiate one vendor from another. The similarities between suppliers are not what's important—it's the differences that count. Here are ten questions you should ask prospective application software vendors before making your selection."*

—John C. Gable,  
Vice President of  
Corporate Systems and Technology  
for American Software, Inc.

	AMERICAN SOFTWARE	OTHERS
1. Can the application software you are considering be easily delivered in a variety of data processing environments (operating system, teleprocessing monitor, and data base) to permit easy migration and allow system software environmental independence?	Yes	?
2. Can the application software be delivered for VSAM and all popular data base management systems, rather than being tied to the application vendor's data base system—one which could be outmoded by new data base products developed by another vendor in this rapidly-changing high-technology industry?	Yes	?
3. Is the application software implemented using a "native" or direct approach to the operating system, teleprocessing monitor, and data base manager, without the inefficiency associated with "bridges" or the vendor dependencies of a "black box" approach?	Yes	?
4. Is the application product coded in an efficient, widely-used, and industry-standard language such as COBOL, rather than a vendor-dependent language unknown to the general data processing community?	Yes	?
5. Can the application product be "tailored" or streamlined to meet the specific functional and operational needs of a company through purchase of a basic package and selected optional features, thereby avoiding delivery of useless code?	Yes	?
6. Does the vendor retain a source version of each customer's uniquely tailored application software for emergency backup, problem determination, and client assistance?	Yes	?
7. Does the vendor have a broad, completely integrated line of application software which can be demonstrated on a single system instead of merely described?	Yes	?
8. Have all of the vendor's products been integrated by design and developed by a single organization, thus eliminating the need for inefficient interfaces and unknown "black boxes" to tie together unrelated or acquired applications?	Yes	?
9. Does the vendor clearly demonstrate a full commitment to the complex business of application software, rather than offer an incidental addition to its main product line?	Yes	?
10. Has the vendor been in the application software business a minimum of ten years with a successful track record of sustained profits and a strong financial posture?	Yes	?

*If the answers to these ten questions make a difference to you, then let us explain the other important differences—the functional differences. Not all solutions are alike!*  
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APPLICATION PRODUCT INTEREST		
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## SOFTWARE & SERVICES

Continued from page 74

rial levels how each level is used to satisfy the end-level requirements. The Job Chaining System can run on any mainframe or minicomputer that supports Ansi Cobol-74.

The system provides visibility to sales order requirements, with indented bill of material relationships of the material resources (inventory, manufacturing and purchase orders) necessary to satisfy the end-level requirements. Full tracing capability allows for the identification of component requirements with their resource commitments and end-item identification of initiating requirements for all manufacturing and purchase orders, regardless of their level in the bills of material, according to the vendor.

The system uses information from any existing material requirements

planning system or it can be used by itself.

Price of the Job Chaining System is \$15,000.

*Manufacturing Management Systems, P.O. Box 14484, Houston, Texas 77221.*

### CCC SOFTWARE Cfi/36

CCC Software has announced the Consolidated Financial Information System (Cfi/36) for IBM System/34 and 36 computers. The package, written in RPG-II, can be modified to provide customized financial reporting either by the customer or by a consultant of CCC Software's parent company, the Computer Consulting Center, Inc.

The package is geared to multinational, multicompany and multilocation organizations and is menu-driven. A built-in report generator requires no compiling or debugging, the company said.

The price of Cfi/36 is \$10,000, according to the vendor.

CCC Software has also introduced a modifiable Distribution/Financial software program, written in RPG-III, for the IBM System/38.

The Distribution/Financial Package has four sections: order entry/invoicing, accounts receivable, accounts payable and general ledger, the vendor said.

Each system as a stand-alone product is priced at \$7,500. All four packages together are priced at \$25,000.

*CCC Software, 575 Eighth Ave., New York, N.Y. 10018.*

### AXIS COMPUTER SYSTEMS, LTD.

**AX/IOM-Finance; AX/IOM-MRP shop floor control module**

Two software products for manufacturing companies were released recently by Axis Computer Systems, Ltd.

The shop floor control module of AX/IOM-MRP helps monitor the productivity of factories. The module offers information about where orders are and where they should be, highlighting bottlenecks and orders that are behind schedule.

AX/IOM Finance provides executives with windows to other AX/IOM software products. The product can be tailored to customers' requirements for financial statements. Both products are designed for the Prime Computer, Inc. Series 50 computers running under the Primos operating system. The packages are written in Cobol.

AX/IOM Finance is available for \$25,000. Cost of the entire MRP package, including the shop floor control module, is \$70,000.

*Axis Computer Systems, 730 Boston Post Road, Sudbury, Mass. 01776.*

### SYSGEN, INC.

**36/Accountant; 38/Accountant**

Sysgen, Inc. has announced two financial accounting packages for companies with multiple financial locations and different management reporting needs.

The 36/Accountant is a fully integrated financial system designed for the IBM System/36. It allows accountants to modify reporting formats or data base definitions. The 36/Accountant lets the accounting manager

Continued on page 77

# \*\*\* The Goal News

NEWS BULLETIN

SPECIAL EDITION

## Goal Systems Announces EXPLORE/VM™

### Comprehensive VM Monitor In A Single Package

EXPLORE/VM is a complete VM performance monitor that offers both real-time and batch reporting facilities in a single package. The real-time facilities are used for monitoring VM's performance on a short term basis while the batch facilities are used for identifying long term trends.

EXPLORE/VM incorporates exception monitoring that is user definable. Exception monitoring tells you when an exceptional performance condition has occurred. By defining the performance variables (i.e. channel busy, CPU utilization) that you want to monitor, EXPLORE/VM can warn you of potential performance problems before they become real problems. And this facility also provides the ability to automatically respond to exceptional conditions as they occur. This allows you to manage per-

formance rather than react to performance problems after they have become critical.

EXPLORE/VM provides additional facilities to aid in isolating performance problems. These facilities include:

- Degradation analysis—tells the performance analyst where performance problems exist over both the short and long term.
- FLASHBACK™—a complete facility that allows previously collected performance data to be displayed in real-time.
- AUTO command—a unique command that allows EXEC's written in either the EXEC2 or REXX programming languages to be executed at user defined times.

### EXPLORE/VM IS EASY TO USE

EXPLORE/VM was designed to be easy to use. There is only one history log file for both the real-time and batch facilities. You will never have to run two different monitors to gather information again. A complete "HELP" facility is

also provided just in case you forget how a command is entered or what the command will do.

EXPLORE/VM's batch reports are produced using a simple yet powerful set of control statements. To produce batch reports, you simply format the history records in the log file and execute the batch reporting job. And you can produce different batch reports as much as you like since the history file is not destroyed.

The archiving facilities of EXPLORE/VM are also easy to use. Complete merge facilities are provided so you can easily keep historical performance data for long term trends analysis.

### EXPLORE/VM IS A TOTAL SOLUTION

EXPLORE/VM is a total solution to VM performance monitoring. EXPLORE/VM is comprehensive and easy to use.

For more information about EXPLORE/VM call us at 800-848-4640.



**Goal Systems**

Goal Systems International Inc.

5455 N. High Street  
Columbus, Ohio 43214-1193  
Phone (614) 888-1775

For more information  
call Goal Systems toll-free today at  
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## SOFTWARE &amp; SERVICES

define data fields within the system's master files.

General ledger, financial statements, accounts payable and cash management application modules are currently available, ranging in price from \$3,750 to \$5,000 each; they can be purchased as one system for \$18,000.

The 38/Accountant package for the IBM System/38 is an expanded version of 36/Accountant. In addition to the modules for the 36/Accountant, the 38/Accountant offers purchase order, payroll, accounts receivable and fixed assets modules. The 38/Accountant as one system costs \$49,500; individual modules are priced from \$5,000 to \$15,000.

Sysgen, Suite 120, 3001 Academy Drive, Durham, N.C. 27707.

#### OUTLOOK SOFTWARE, INC.

##### Outlook/GL

Outlook Software, Inc. has announced a general ledger package written in RPG-III that incorporates its Outlook/38 financial modeling program. The Outlook/GL package runs on the IBM System/38 under IBM's CPF operating system.

The integration of the two packages allows the user to do financial modeling with general ledger data, according to the vendor. The software reportedly includes a report writer and allows for consolidation and multiple company reporting from the same data base.

Other features include variable and/or recurring journal entries, automatic journal entry reversals, on-line selection and display of transaction data, automatic allocation formulas, standard or customized ratio calculations and preliminary period closes.

The Outlook/GL package license fee costs \$10,000.

Outlook Software, Suite 117, One Woodfield Lake, Schaumburg, Ill. 60195.

#### PRIME COMPUTER, INC.

##### Sammie

Prime Computer, Inc. has announced a computer-aided design (CAD) system that tests the comfort, viewing parameters and movements of a person within an environment prior to the fabrication of a prototype model.

A Prime spokesman said the System for Aiding Man/Machine Interaction Evaluation (Sammie) is an interactive three-dimensional CAD modeling system that can be used to build a simulated environment such as an automobile, cockpit or office. It includes a computerized human model with reach and sight capabilities that simulates a person's movements in the environment.

Virtually any size or shape person reportedly can be represented through specific dimensional changes or statistical profiles of population groups. Analytical facilities include the ability to "become" the model and observe the designed objects or environments with the model's "eyes." The user can also interactively test the model's reach capability to any point in the workspace and can analyze the fit of differently sized models into given spaces.

Sammie consists of three

groups of independent modules sold as a package. The first contains the three-dimensional modeling functions, the second provides the model and its related analysis facilities and the third provides additional evaluation routines. It runs on all Prime 50 series 32-bit computers under the Primos operating system. It is priced between \$40,000 and \$50,000.

Prime Computer, Prime Park, Natick, Mass. 01760.

#### DATA GENERAL CORP.

##### CCA Emacs

Data General Corp. and CCA Uniworks, Inc. (CCA) of Cambridge, Mass., have announced that DG has been licensed to market CCA's text editing system, CCA Emacs, for use on DG's Eclipse MV superminicomputers and Distributed Systems (DS) workstations running under DG's AOS/VS; MV/UX, which works in association with AOS/VS; and DG/UX operating systems.

CCA Emacs is also available with DG's Common Lisp programming environment.

DG will provide customer support and training.

Initial license for CCA Emacs on the Eclipse MV superminicomputers is \$2,400. Initial license for CCA Emacs on the DS workstations is \$475.

Data General, 4400 Computer Drive, Westboro, Mass. 01580.

See **TOOLS** page 80

## SCIENCE / SCOPE

The first U.S. facility for making gallium arsenide solar cells on a standard production line is now under construction at Spectrolab, Inc., a Hughes Aircraft Company subsidiary. Gallium arsenide cells, which are now being made on a prototype line at Hughes Research Laboratories, will help satellites and spacecraft become more efficient in converting sunlight into electricity. Compared to conventional silicon cells, gallium arsenide cells generate up to 30% more power and operate at much higher temperatures. The first cells are expected to come off the production line in mid-1985. Full-scale mass production at rates to 15,000 cells per year is scheduled for January 1986.

A spacecraft orbiting Venus will be used to observe Halley's Comet during the comet's closest approach to the sun in early 1986. NASA's Pioneer Venus Orbiter will be reoriented next year to examine Halley between December 1985 and February 1986, when the comet and Venus will be on the far side of the sun from Earth. The Hughes-built spacecraft has been making radar maps and performing other scientific studies since arriving at the cloud-covered planet in 1978. In April the Orbiter, designed to operate just one year, proved it could conduct the Halley mission when it viewed Comet Encke for eight hours. During the test, the spacecraft's ultraviolet spectrometer surprisingly revealed that Encke is losing water through evaporation at a rate three times higher than expected, based on previous observations.

A new target cueing system makes shoulder-fired missiles more effective, allowing troops to fire at aircraft day or night or in bad weather. The prototype uses the Low Altitude Surveillance Radar (LASR), a recent Hughes development, and the Position Location Reporting System (PLRS), in production for the U.S. Army and Marine Corps. It enables a gunner to use the full capabilities of the missile and assists him in making the split-second decisions needed to engage fast, low-flying aircraft. LASR pinpoints incoming targets while PLRS provides the precise location of both the radar and the weapon. Small lights integrated into the missile launcher sight direct the gunner and tell him when the target is within launch range. Tests show that gunners can learn to operate the cueing portion of the system with only 20 seconds of practice.

Paper-thin gallium arsenide solar cells have been fabricated using methods identical to those used for making conventional gallium arsenide cells. The new cells would reduce the weight of a spacecraft and hence the cost to launch it. The new thin cells exhibit an efficiency of greater than 16%. A typical cell is approximately 70 micrometers thick and weighs 0.2 gram. The demonstration proves that Hughes research scientists can transfer experience, techniques, and processing steps for making conventional cells to the thin cells.

Hughes Ground Systems Group is preparing to apply its airspace management experience to the exciting challenges of worldwide air traffic control. These systems will be designed to ensure service 24 hours a day, 7 days a week. They will support distribution of processing among multiple computers linked via local area networks. The many challenges include design and development of hardware and software to support advanced display and man-machine interface technology, and using satellite technologies for future ATC applications. To help design the next generation of air traffic control systems, send your resume to Hughes Ground Systems Group, Employment Dept. S3, P.O. Box 4275, Fullerton, CA 92634. Equal opportunity employer. U.S. citizenship required.

For more information write to: P.O. Box 11205, Marina del Rey, CA 90295

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Touch Tone is a trademark of AT&T.



begins to separate itself from those single phone answering gadgets.

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That's not surprising. We're the people who taught telephones and computers and people how to work together. We can show you the most advanced ways to manage voice and data today, next year and into the next century.

If your business phone system has you talking to yourself, it's time to talk to ROLM.

**ROLM**



## SOFTWARE &amp; SERVICES

**TOOLS** from page 77**COMPUTIME, INC.**  
Polling software

Computime, Inc. has introduced communications software for memory-based, retail point-of-sale and banking terminals.

The software, which operates on IBM mainframe computer systems running DOS/VSE and using synchronous and asynchronous communications protocols, is said to provide access to memory-based cash registers. Networks requiring two-way communications reportedly can select optional transmission features. A modular design allows the user to mix multiple device types.

The product license begins at \$65,000 and increases according to the modules selected.

*Computime, River City Office Park, 401 N. 117th St., Omaha, Neb. 68154.*

**PBL ASSOCIATES, INC.**  
Inventory Management and Accounting; Purchasing and Receiving; Order Entry and Invoicing

PBL Associates, Inc. has introduced three distribution application software packages that operate on Tandem Computer, Inc.'s Nonstop superminicomputers.

The Inventory Management and Accounting, Purchasing and Receiving and Order Entry and Invoicing systems are said to use distributed data processing to provide immediate on-line access to data from all the user's sites. The packages include a security system, the vendor said.

With the Inventory Management and Accounting System, inventory operations from shipping to receiving are monitored. Each item and lot can be located by warehouse, area, aisle and bin; classified by product family, group and class; and assigned ownership by company, division and department, the vendor said.

The Purchasing and Receiving system provides on-line, multicompany, multidivision control and processing of purchasing and receiving functions, the vendor said. The package reportedly handles traveling requisitions and open and blanket purchase orders. It also consolidates multiple requisitions and purchase orders.

The Order Entry and Invoicing system provides on-line entry, editing and inquiry capabilities that reportedly enable the user to take orders over the phone and answer questions about orders, pricing, product information and account status.

The programs are priced at \$50,000 each for a perpetual license.

*PBL Associates, 10 Cottage Ave., Point Richmond, Calif. 94801.*

**CAMBAR BUSINESS SYSTEMS**  
Control System

Cambar Business Systems has introduced an enhancement to its order entry software designed for companies doing telemarketing.

The Control System telemarketing process allows online inquiry into a variety of

sales options via a CRT, the vendor said. With the program, a user can learn the availability of inventory in different company locations and the quantity break prices for merchandise.

The Control System package runs on IBM's 4300 series mainframe hardware. Available modules include order entry, accounts receivable and inventory control. The program is priced at \$150,000.

*Cambar Business Systems,*

*P.O. Box 10067, 2864 Azalea Drive, Charleston, S.C. 29411.*

**DATAPLOTTING SERVICES, INC.**  
D-Pict

Dataplotting Services, Inc. has announced the conversion of its D-Pict graphics software products line for all Data General Corp.'s MV series superminicomputers.

D-Pict products include D-Pict/B, a business graphics

package; D-Pict/VGL, a library of subroutines and utilities for graphics applications; and D-Pict/Graphkit, a library of callable subroutines.

Prices for D-Pict products range from \$4,000 to \$15,500, depending on the product desired and MV series superminicomputer model used.

*Dataplotting Services, 225 Duncan Mill Road, Don Mills, Ont., Canada M3B 3K9.*

**INTRODUCING  
DECmate III.**

## SOFTWARE &amp; SERVICES

**MRP** from page 63

explosion or implosion chains are long.

**2. Material requirements planning.** MRP offers the ability to improve inventory turns dramatically while still maintaining valid shop floor priorities. This is accomplished by keeping an up-to-date material plan that will bring inventory in the door in time to build products.

DBMS supports this process by exploding bills of ma-

terial to calculate the exact amount of inventory necessary to build manufactured items. The details of inventory requirements are maintained in an order data base, and adjustments are continually made as conditions change.

A DBMS must be able to sequence and update the same data efficiently by several different keys. It must also be capable of processing vast amounts of data quickly. One of the major considerations

in the selection of a manufacturing DBMS is the ability to make MRP run in an acceptable amount of time.

**3. Shop floor control.** Real-time transaction reporting that keeps the data base current is often necessary to support immediate decision-making regarding material shortages, machine outages and product defect minimization. It is also essential that a company be able to gather labor and scrap data to know exactly where everything is

at any given moment.

A DBMS must provide high-volume update capability around the clock to support a three-shift manufacturing operation. Shop floor functions must often continue to operate even while massive amounts of data are being updated by MRP.

**4. Master scheduling and capacity planning.** Getting the right materials to the factory at the right time is a pointless exercise if you are building the wrong products

or you do not have enough shop floor capacity to process the material. Simulation techniques are used to model the building schedule and the ability to build. A central repository of manufacturing data must be available to these simulation programs in parallel to day-to-day manufacturing activities. A DBMS must provide the capability to maintain an on-line update of data while many batch programs concurrently read or update the same data.

**5. Cost management.** Standard costs must be calculated from the cost of subassemblies through the bill of material and the routing data bases. Actual costs are collected from the shop floor.

Costs can only be managed when management is allowed to play complex "what-if" games against this data. The most relevant decision tools take existing cost trends and project them into the future based on the material plan created by MRP.

When powerful ad hoc query tools can be applied in a real-time mode to the data base, pricing and production decisions can be made in a highly reactive fashion. The most powerful on-line reporting tools are associated with relational DBMS.

Extensive searching against chain-based DBMS systems is usually relegated to batch processing due to the relative inefficiency of searching against keys not previously defined. It is usually more expedient to create a batch copy of the data in a different sequence, such as a Q-file, than it is to make structural changes to the way data is stored.

In addition to supporting basic manufacturing functions, a DBMS must allow manufacturing data to be used by all other corporate functions. For example, sales order entry and demand forecasting must feed into the master scheduling function.

Two very important requirements for the DBMS surface in light of these interfaces.

■ It is very difficult to predict initially all the ways manufacturing data must be interfaced to other systems. The most reliable method of ensuring smooth future interfacing is to select a DBMS that facilitates easy changes to the way data is stored and structured. The relational DBMS excel in this area.

■ When manufacturing systems are fully in place and integrated, a tremendous amount of data is being maintained. Efficient methods of summarizing data to do unforeseen processing or reporting are essential, since unloading or restructuring vast amounts of data becomes increasingly less practical. Again, the most efficient, large-volume, ad hoc query functions are done under the relational DBMS.



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## SOFTWARE & SERVICES

### ADA from page 63

The above firms and a handful of others have braved DOD's rigorous testing and have neatly positioned themselves to reap the benefits of supplying Ada programs and products to both defense and commercial markets. It is clear that any company intending to target its products to the DOD had

better get on the Ada bandwagon if it is to survive as a supplier in the next decade. But what about the commercial market?

It would not take the special talents of a psychic to predict that Ada will somehow make its way into mainstream data processing. The software problems the DOD faced are certainly not unique to

that environment—clearly most large-scale software development organizations could benefit greatly by adopting the powerful, versatile language.

Insiders say Ada will make its first forays into the commercial sector in companies that develop software for both military and civilian markets. With a growing number of products becoming available, such as those already mentioned, more and more companies will begin to realize the advantages to be gained by exploiting the fruits of the DOD's labors.

The question is when. Most DP and MIS managers have become accustomed to looking to established hardware and software vendors for the promised "solutions" to their problems. In the software realm at least, the powers that be have been notably silent on Ada. That is probably because they have a vested interest in older languages like Cobol. Thus, it is unlikely that the established software vendors will be offering much in the way of Ada support for some time to come.

That presents a unique opportunity to the fore-runners who gambled on Ada. Should the big software firms decide to venture into Ada waters, the Ada pioneers will still maintain a considerable head start owing to the long DOD certification process that all potential vendors must endure. That head start gives the current Ada product vendors a chance to exploit whatever market currently exists. It also makes those vendors attractive partners for companies that would like to reap Ada profits without committing to the R&D and validation rigors required to bring products into the market. That is already happening. A case in point is Telesoft's recently penned multimillion-dollar contract with IBM.

For the short term, however, foresighted DP and MIS professionals who wish to experiment with Ada in their shops will, for the most part, have to look to the pioneers. But those professionals, who are charged with the somber responsibility of evaluating and adopting relevant new technologies to meet their organizations' information needs, should not despair that the established vendors are not yet offering any Ada-based solutions. Even the big guys were pioneers once.

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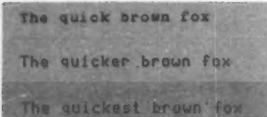
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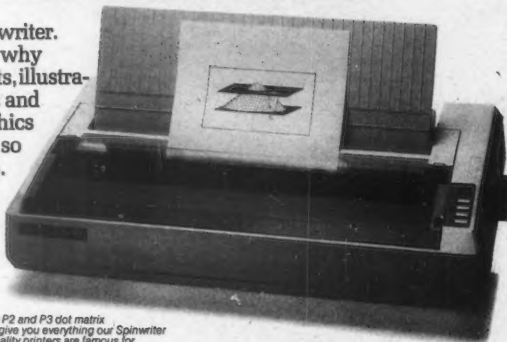
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## SOFTWARE &amp; SERVICES

**EXPRESS** from page 63

bles, personnel, flight operations and crew scheduling. The commercial IMS system runs on an IBM 3084 Model Q64 and supports approximately 2,000 terminals. Cosmos runs on a 32M-byte IBM 3081 mainframe that supports an additional 1,600 terminals.

To ensure efficient performance of this complex system, Federal Express maintains Candle Corp.'s Omegamon/IMS, a proprietary software system that provides a window into IMS activity on a real-time basis and automatically detects and warns of IMS availability and performance problems. The kind of information that Omegamon/IMS provides is vital to the company, said Eddie Freeman, project manager at Federal Express. "We are a fairly young company, and

we are almost totally dependent on our computer systems. When our systems are down, the company is in trouble. We have a 99% system availability goal that we hit regularly. Meeting that goal is vitally important to Federal Express," he said.

However, maintaining a 99% availability level is not accomplished without some problems along the way. For example, during the week of implementation, when Federal Express converted to IMS from IBM's Airline Control Program, Omegamon/IMS was used primarily for direct-access storage device (Dasd) placement to determine what percentage of time the devices were busy.

Transaction volume was another important factor. Using Omegamon/IMS, "we could tell by the [relative byte address] that was shown on the screen where problems were occur-

ing [and] whether they were data base- or application-related," said Don Liedtke, consultant to the data base administration group.

"Being familiar with both of them, he continued, "we could then isolate the problems and solve them more quickly."

One of the difficulties Federal Express faced involved Dasd placement problems such as data set placements that were overworked and overloaded. Some of the transactions were performing poorly, indicating that the data set placement on particular data packs was incorrect. On the basis of information obtained through Omegamon/IMS, the placements were changed immediately.

Another feature of Omegamon/IMS is its ability to zero in on specific problems as they occur, rather than relying on information that may be

as much as two days old before it is reviewed. Liedtke said, "In the IMS system, the log tapes are not the handiest things to use, but we were able to react on the fly with Omegamon/IMS. That's a great benefit. I would say the commercial area of Federal Express is operating much more effectively and efficiently as a result of putting in a real-time monitor. Omegamon/IMS has shown us many problems that we previously glossed over or misunderstood."

Not only did Omegamon/IMS help solve various problems, it also improved the learning curve for those involved in its use at Federal Express. Freeman said, "One of the ways that Omegamon/IMS helped was by letting us see the effects of a change immediately. As soon as the system is started up, we notice a difference in activity or related functions." Perhaps the area that has been helped the most is isolation of program problems. Omegamon/IMS lets the programmer see what is causing a problem and whom it is affecting, and it helps determine which terminal is being locked out, according to Freeman. These are the kinds of observations that are difficult to make using traces or similar methods.

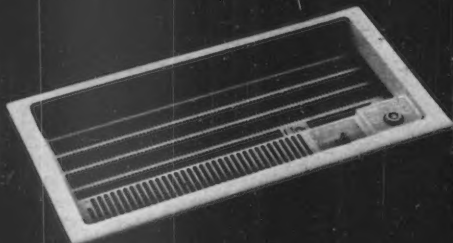
**Productivity benefits**

Freeman also found that Omegamon/IMS provided a quick and easy method to obtain needed information, a factor resulting in productivity benefits. "The exceptions are highlighted on the screen, and they jump out at you," he said. "This is a particularly important feature when you're waiting on [save area prefixes]. Now it's easier to see conditions that pass quickly. Previously, they went unnoticed."

As a result of gaining this kind of information so readily, additional time has been freed. Freeman described a situation in which one of the senior systems programmers had more time because he no longer had to compile reports about system activity or formulate tuning reports and search through traces. These functions could be accomplished by using Omegamon/IMS to take a "snapshot" of the system. Freeman said, "I believe that Omegamon/IMS has brought back about 30% of the senior systems programmers' day."

In the areas of problem resolution, education and productivity, the Candle product has provided enormous benefits for Federal Express. Liedtke said, "Using Omegamon/IMS has allowed us to use our time more efficiently. We've been able to identify problems and learn from our experiences. The information we gain increases our learning curves for educating other data base administrators or technical support people, even the application groups. Everyone can understand what's happening more rapidly. We all agree that it has increased productivity significantly."

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**STRATUS** from page 63

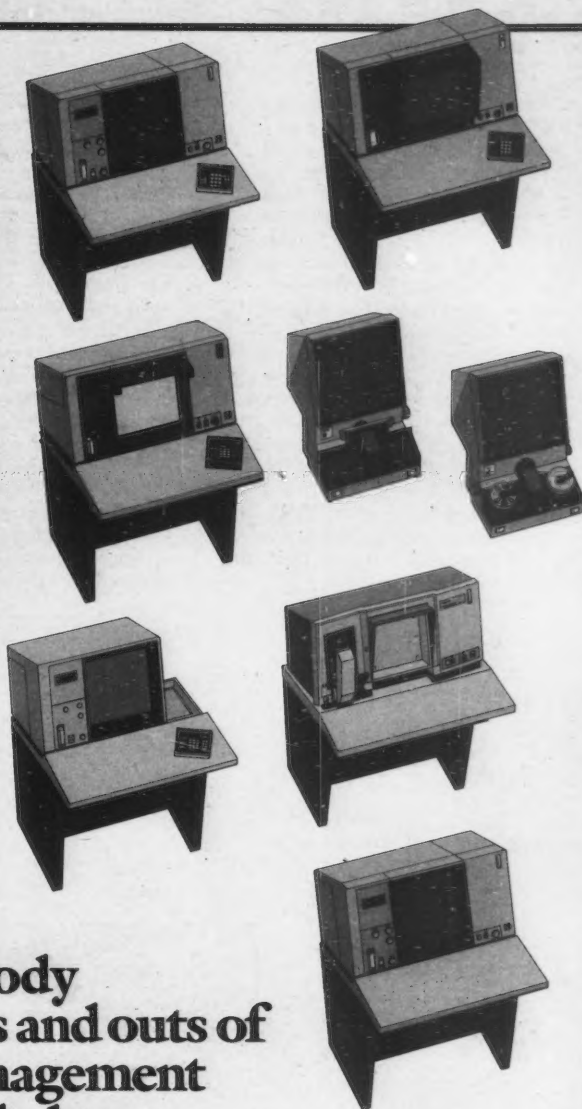
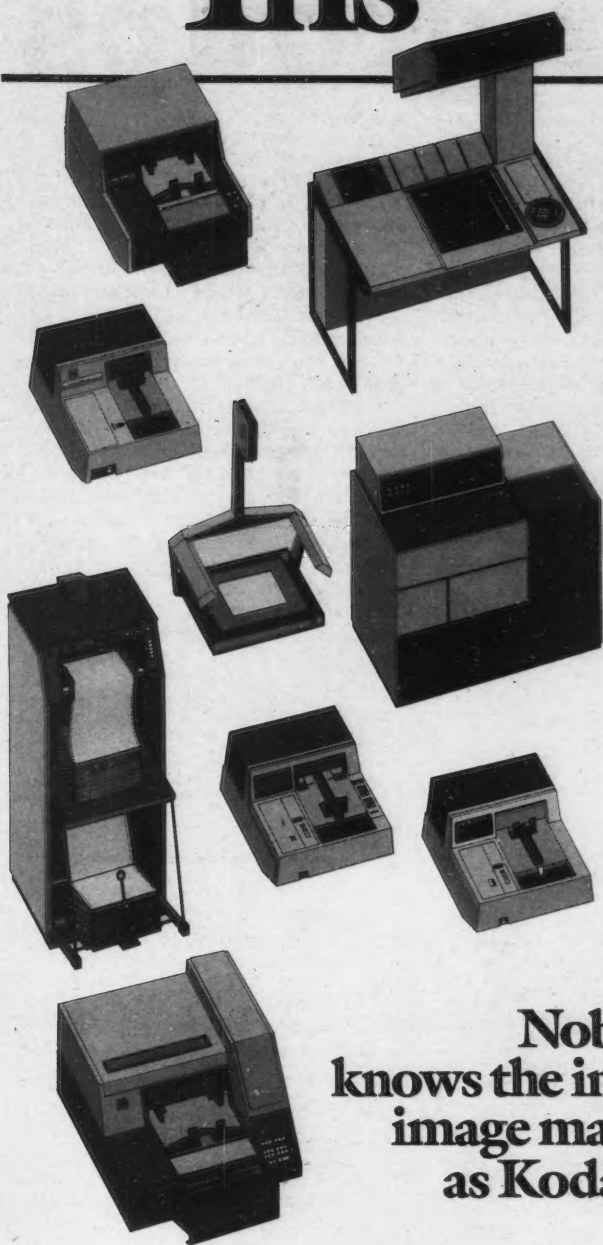
oped in standard programming languages on other systems reportedly can be converted for use on Stratus fault-tolerant systems.

The Stratus Oracle relational DBMS is scheduled for shipment in the first quarter of 1985 at a price of \$30,000.

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# IBM user groups

Mention Guide and Share to any IBM mainframe customer and chances are he will know exactly what you are talking about. For nearly 30 years, the two organizations have served as a forum for IBM mainframe users to learn, analyze and complain about IBM. The domestic and international arms of the two user groups constitute a powerful union that influences IBM as well as the entire computing community.

In a sense, Guide and Share chronicle the history of modern computing. Both groups were formed in the mid-1950s, when a handful of computer pioneers gathered to discuss the then-experimental use of computer systems. Share was born in 1955 with 17 member installations; Guide was formed a year later with 44 installations.

Today, Share boasts 1,987 domestic members and Guide, 2,600. Many installations belong to both groups, yet rarely does the same company representative become actively involved in both.

The structure and organization of Guide and Share parallel the maturation of the computer industry in some respects. Share emerged as a consortium of scientific computer users. The bulk of its 17 original member installations were users of IBM's 701 processor. In contrast, Guide was founded by commercial users of IBM's 702 and 705 processors. Today, remnants of those scientific vs. commercial charters still exist, but the two organizations' functions overlap as much as they complement each other.

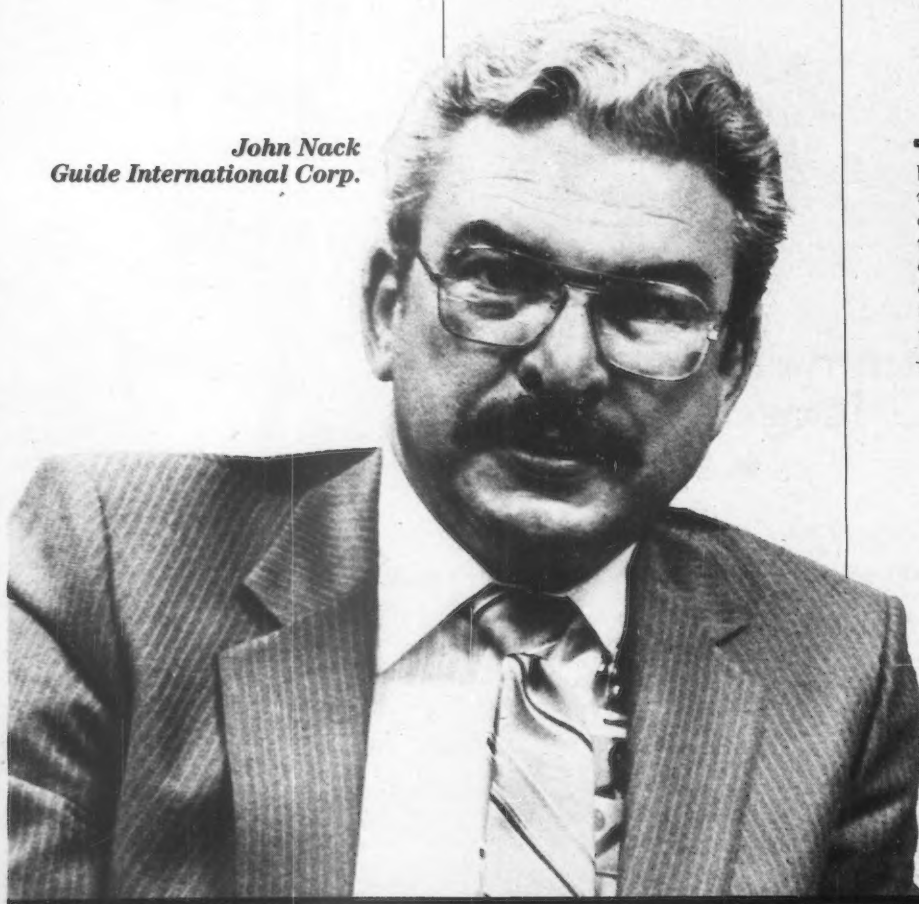
From organizational and operational standpoints, the two groups are

almost identical. In fact, Guide and Share have, on occasion, discussed the possibility of merging. The membership of each group voted against those proposals.

Membership requirements are almost identical. Guide's members must operate an IBM 4300 series or larger processor. Share is slightly more specific. It requires members to have at least a 4361 Model 4.

Users of smaller IBM systems form a group similar to Guide and Share called Common. Traditionally, Guide and Share have had little to do with Common. But largely because distinctions between processor classes are increasingly blurred, that tradition is changing. Guide recently began to exchange more information with Common, and Share is watching that experiment, perhaps considering a

**John Nack**  
Guide International Corp.




---

*We have a lot of people who are interested in coming to Guide and taking an active role, but we are having trouble back at the shop convincing the boss that there is a real benefit.*

---

# Interviews with the presidents of Guide and Share

similar relationship with Common.

Tom Henkel, *Computerworld's* senior editor, systems, recently interviewed the presidents of Guide and Share. Like their groups, John Nack and Bill Butterfield have much in common, ranging from similar career paths to their views on IBM.

Nack is midway in a two-year term as president of Guide. He also manages the Processing Network Division of Caterpillar Tractor in Peoria, Ill.

Nack chuckles when he recalls that the now-mammoth Caterpillar data processing operation did not even exist when he started working for the company 32 years ago. He became involved in DP almost on a whim. Caterpillar was sending volunteer employees to IBM training classes. Nack volunteered.

After years of involvement with

Guide, Nack moved into the president's seat at a time when Caterpillar was suffering severe financial problems. Nack admits that his request for time away from his duties at Caterpillar was met with some raised eyebrows, but he won corporate support nonetheless.

Butterfield officially finished his two-year term as Share president about one week prior to his interview with *Computerworld*. Former presidents of Share, like Guide, move from president to a two-year stint as past-president.

Now in his 20th year with General Motors Corp., Butterfield works in a suburban Detroit research facility. He now focuses on shaping GM's involvement with computer-aided design and manufacturing. When elected president of Share, Butterfield worked in

GM's research laboratory. And, like Nack, Butterfield became president of the user group at a time when GM suffered declining revenues.

"Research Labs was, to some extent, insulated from the hard economic times. They saw the benefits [of the Share presidency] outweighing the negatives when they made the commitment," Butterfield said.

When it comes to IBM, Nack and Butterfield have grown to realize that influencing the corporation's policies is neither an overnight process nor a sure thing. They made it clear that the only way to change the collective minds of IBM management is to leave emotion behind and present a strong business case.

Nack's interview begins on ID/4, Butterfield's on ID/8.

*Share's tendency has been to keep IBM a little bit at arm's length. We do not want them in our hip pocket, nor do we want to be in theirs. We want to present a proper customer view that is in some sense influenced by what IBM says is the current strategy.*

**Bill Butterfield**  
**Share, Inc.**



## IN DEPTH/NACK INTERVIEW

## An interview: John Nack



What is the principal focus of Guide? Is it a large voice used to influence IBM, or is it an educational organization formed primarily to share experiences?

Over the past 27 years there has been a need for users of IBM equipment to exchange experiences, to learn from one another. I think that is one of the biggest purposes we serve; we are a forum to exchange information and interact with one another. A part of that is that when a significant number of people become concerned about one thing, then obviously they'd like to bring IBM's attention to it. We attempt to influence IBM; there is no doubt about that. But that is not all that Guide does.

We study new products and tell IBM their shortcomings. We study old products and describe their shortcomings. We exact a set of requirements and expect them to react. We say: "Here is the formalized set of requirements related to this product, and we expect that you will look at our requirements, attempt to understand them and fix those you believe are worth fixing."

In all instances, there has to be some sort of business case built from their point of view. But if you take Guide, Share, the European Guide, European Share and the Australasian Guide, we have five organizations where, if we get them all together and focus on a subject, we represent a significant amount of IBM's customer base.

**Does Guide function independently of IBM?**

We have IBM speakers, but we also have non-IBM speakers. We have IBM involvement, but we are a separate, independent company.

**Do companies with a Guide membership get any special treatment from IBM, such as advance notice of product announcements?**

I don't think so. We don't get any free announcement material, any more than I get as a large customer. IBM is very careful about preannouncements. They have been for years. Statements of general architectural direction, and that sort of

thing, we usually receive about six to eight weeks after the trade press publishes them.

**Is there a set of rules governing how Guide deals with IBM?**

No, I wouldn't say there is a set of rules. There is a certain technique, I guess you could say, we have managed to polish up over the years. We keep a set of requirements, problems or ideas generated on the project level that address a specific product. We keep those in a particular format. We tend to use a similar format in almost any dealings with IBM: state the problem, what we think ought to be done and why we believe IBM would benefit by fixing it. We attempt to make a business case.

**Do representatives from all five**

**user groups get together to talk about their current problems and concerns?**

Yes, there is an international meeting. The five presidents from the five organizations meet on an annual basis. There is not as much interchange at the project level, as much face-to-face meeting, as might be expected. International travel gets to be very time consuming and expensive. There is a significant amount of exchange of written material.

**Being president of Guide obviously requires you to spend a fair amount of time away from your job at Caterpillar. Has that been a problem?**

It does not take a significant

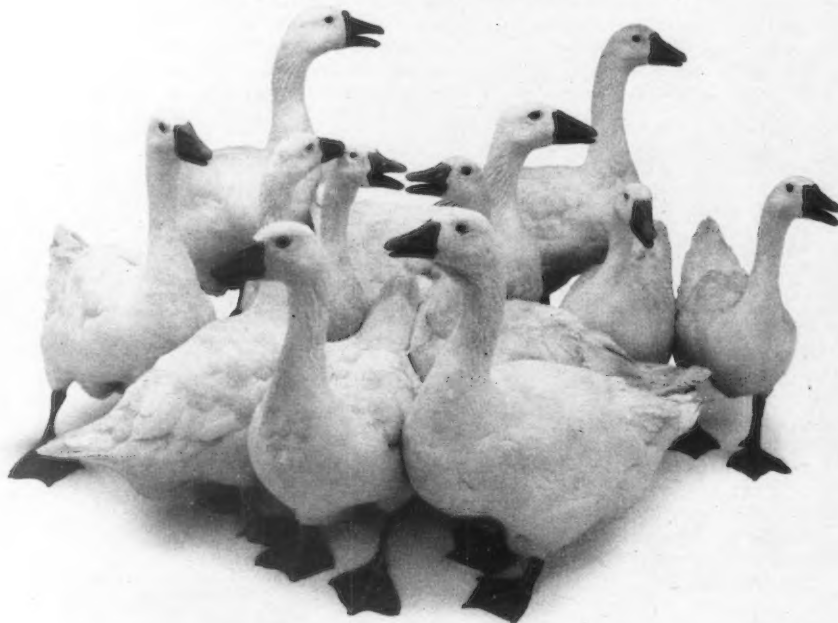
amount of time out of my day-to-day job because I just don't let it. I do most of my Guide work at home, at night. It does require more travel than I would have otherwise have to do. As a result, I am absent from the workplace more often.

**How much time does heavy involvement in Guide take away from the participant's regular job?**

I don't think there is any way to put a percentage on it. I believe if you're investing more than 25% of your normal total working time in an outside function, you are probably jeopardizing your employment. What I believe you should do is try to do 100% of your regular job and take 25% of your own time.

The commitment we ask for is to be active for two full years. We meet

**When the experts choose  
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by all the squawking.**





## IN DEPTH/NACK INTERVIEW

three times a year now, for a week each time. So for people who want to be active at the project level, we are asking them to take six weeks out of the following two years to come to Guide. That gives some people trouble.

**Does that cause a problem in getting good people to sit on Guide committees?**

Yes, it does. If you are having constant turnover, you're not making as much progress as you should be making. People who appear for the first time [in committee meetings] have to catch up with what has happened at the past three meetings. It gets to be a time-consuming job.

**Guide is made up of many diverse IBM users. Some Guide at-**

*If we feel an IBM presentation is a sales pitch, we tell IBM we don't want that again. After all, this is an IBM user group. Why should anyone be selling IBM to an IBM user group?*

tendees come from very large, sophisticated DP shops. Others come from small, unsophisticated shops. How does Guide manage to provide useful information to such a broad range of IBM users?

That is one of the challenges of this type of organization. On occasion, we have evaluated the idea of categorizing ourselves into large and small users. But there are a number of ideas that aren't sensitive to size. Security and the acquisition, retention

and training of good people are not size-sensitive issues. Size becomes, or it seems to become, more sensitive as you get into the hardware and software issues. And the way we tend to address those issues is to have projects that spring up to address a specific product (hardware or software). This approach tends to attract the people who are large enough, or small enough, to use that particular product. It fixes itself.

I believe we have to consciously avoid gaps in the overall coverage. I

don't believe we should abandon the small user just because he's a small user. On the other hand, I don't think there is any reason to tend, nurture and feed 1401 programming. There has to be a time when interest in a subject dies off.

We started out with 44 members, and now we're at 2,600. I can see how some people can get lost. When I first went, I was lost. I went because I had some people who'd been going for some time, and they were telling me what a wonderful organization it was.

For the first two meetings, I was significantly at sea. I was one of those people who said, "Guide ought to be broken in two — big guys on one side and little guys on the other." The more I was around, the more I discovered that I had more in common with the little guys than I did with some of the big guys.

**Organizations built around a specific focus or issue tend to become cliquish. Is that a problem within Guide, and how do you handle it?**

I don't really sense it is a problem. I think it is really the individual that makes the contact and develops the ongoing interest in the organization. Guide is a user-driven organization. We do not start a project unless enough people want to know about it. In fact, we've had experiences where the board of directors has thought something would be a real burning issue and we haven't been able to find anyone who agreed.

**What do you find are the most pressing issues from the user's standpoint?**

We tend to keep a list of what we call our major concerns. The issue of continuous systems operation has been among those concerns for the past few years. I think there is new interest coming forth in security and relational data bases. There is obviously some smaller subset of our organization that is interested in what IBM will do on the low end; there are others interested in what IBM will do on the high end. I expect we will develop some projects on IBM's new [3480] tape subsystem. I would imagine that some of the membership will come forward and say, "We've got to know more about the Personal Computer AT."

**Do you try to coordinate Guide presentations with IBM product announcements? For example, do you try to get someone from IBM to explain the major announcements over the past few months?**

We do that at the project level. There is a basic education we ask IBM to offer. And we seek some directional information. For example, we'll ask IBM, "What do you think this means, and how do you think we'll handle libraries?" That sort of stuff.

**How do you avoid getting sales pitches from IBM?**

If we feel an IBM presentation is a sales pitch, we tell IBM we don't want that again. Basically, we'll try and keep that IBM presenter from coming back to Guide, or we'll make sure that we don't invite anyone from that particular group without

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## IN DEPTH/NACK INTERVIEW

*We're not attempting to provide a marketing opportunity for anybody. The requirement for membership is that you have 4300 or larger equipment. If a consultant's firm has that kind of equipment, I don't see why we should try to keep him out.*

making it very clear that we're not interested in sales pitches. After all, this is an IBM user group. Why should you be selling IBM to an IBM user group?

IBM is announcing products much more frequently than, for example, the IBM 370 days when the company appeared to be on a five-year announcement schedule. Is keeping up with these rapid-fire product announcements a problem for

users?

Of course, it is making it more difficult to keep up. We suffer from the same, or a similar problem, as IBM. We're only capable of assimilating so much information. And IBM is only capable of disseminating so much information. With the IBM product cycle getting shorter, we're finding that we have to talk to individuals within IBM if we want to get into any depth on a product.

**Have IBM's accelerated product announcements changed the type of information Guide provides?**

No, I don't think it has yet. There is the potential that it could, because by the time we study a product there may be a new product in the offing. We typically take a year — maybe two years — to do an in-depth analysis of what we think is wrong with a new IBM product. We then go to IBM and say, "Here is our set of requirements." If IBM's product cycle is two years, it is hardly worthwhile.

Over the past few years, the differences between classes of CPUs have become blurred. Guide's minimum requirement for membership is an IBM 4300 series processor. There are probably users of other IBM systems, such as System/38, who would argue their shops are at least as sophisticated, if not more so, than a 4300 user. Are the guidelines for Guide membership becoming a problem?

That is going to be a continuing problem, particularly with larger intelligent workstations. I don't know how in the world we are going to face up to that. At the moment, we feel there is enough of a difference between the 4300 and larger systems. But suppose a really powerful intelligent workstation is announced by IBM. How are we going to ignore something like that? I don't know. I don't know exactly how we can be ignoring System/36 and System/38 now. I guess you have to draw the line somewhere. For example, if System/36 and System/38 users came in, you are getting up against the question once again of, "Is Guide too big and how do you appease everybody?"

**Does Guide get involved in issues outside the IBM user community, such as standards issues?**

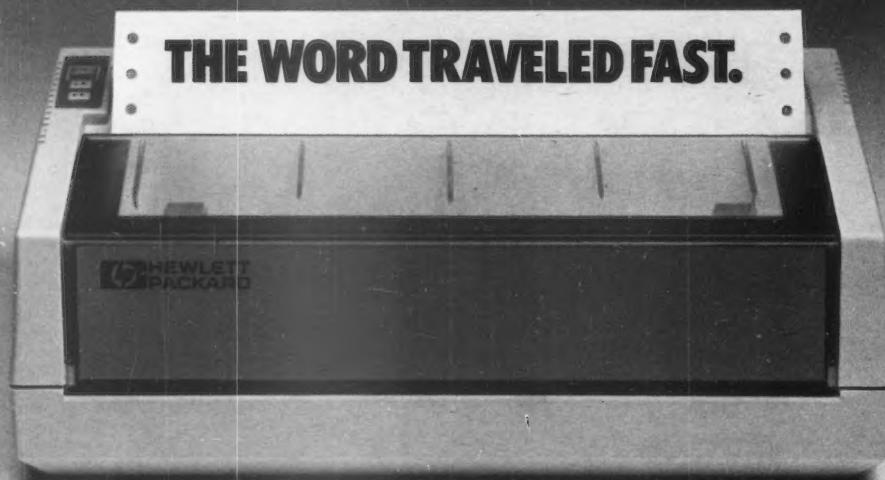
We are involved with standards issues. We have a liaison to the International Standards Organization and the American National Standards Institute group. For example, we are involved in Cobol standards.

We have given an opinion on the Cobol standards proposal at least twice in the past two years. Guide has a member of the Ansi Cobol committee, and he attends from six to eight meetings a year.

**Over the years, Guide has maintained a fairly low profile with respect to the trade press. Why?**

The reason, as it has been expressed to me, is that in

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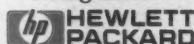
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## IN DEPTH/NACK INTERVIEW

the past we didn't feel we got fair treatment in the press. There was a tendency on the part of the press to try to cast the user group and IBM in an adversarial relationship. And that didn't serve either Guide or our relationship with IBM. So we chose to keep a low profile.

#### How does Guide get its message across to IBM users?

I think the informal communication among people of a similar ilk is what probably gives users the necessary understanding of what Guide is about. You'll find that most people who dabble in software will know that within Guide and Share there are projects. The same thing is true with hardware. So I don't think it is a matter of becoming known by people in the business.

Giving users the opportunity to make a commitment to Guide is different. That is why I think we need to have a slightly higher public profile.

I believe the people the technicians work for need to understand that the Guide and Share user groups can have an influence. We have a lot of people who are interested enough to come to Guide and take an active role, but we are having trouble back at the shop convincing the boss that there is a real benefit.

How do you deal with keeping the right type of people in the organization? For example, I understand a fair number of consultants attend Guide.

I don't sense there is a great number of consultants in the audience or the membership at a particular time. There are some Big Eight accounting firms represented, and it is hard to determine whether their representatives are from the accounting or consulting side.

If someone from a consulting firm was trying to sell his consulting services, there would be a problem. We're not attempting to provide a marketing opportunity for anybody. The requirement for membership is that you have 4300 or larger equipment. If a consultant's firm has that kind of equipment, then I don't see any reason why we should try to keep him out.

#### What are your major concerns about the future of Guide?

I am concerned about whether we can attract the right kind of people to continue the organization. I think Guide has done a lot of good work over the last 27 years, and I think there is a lot of good work to be done. But we need real employer commitment. We have the overall propagation of the organization to consider.

It is somewhat easier for some employers to allow the first-hired technician to go for six weeks rather than allow the manager to go for six weeks.

The management function in an organization this size has to be addressed. Sometimes the technician is capable of growing into being a manager, sometimes he is not.

#### How do you get that corporate management commitment?

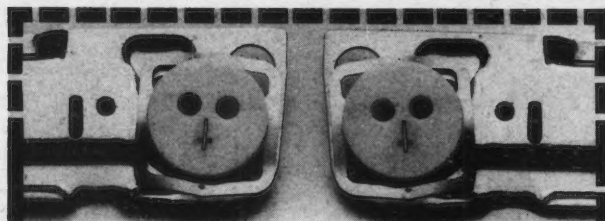
We have a computer executive meeting in every city we move into in an attempt to attract the top computer executives in that geographic area. We tell them what Guide is all about, and we have the IBM representative tell them what IBM thinks Guide is about. So the executive gets both sides of the story.

It is very difficult when you go to Guide as a nontechnician and find out that you never heard of the first three topics. I can't say we're doing a good job in trying to speak more in the language of management, but we're trying. We have a management division that regularly sponsors a series of meetings we call Management Interchange. It's for the person who comes to Guide and really doesn't know enough about the technical aspects to talk JESS, but he might be the manager of people who talk JESS. He can voice his opinion, bring up his subject and see what the other people sitting around the table have to say about it. Sometimes, you get some very good value that way.

#### Have you noticed a change in IBM since John Opel took over as president?

I can't attribute it directly to John Opel, but there has been a change in the past two or three years. IBM is more open than it used to be. They are more willing to seek our opinions. They listen with an open mind — at least it appears that they do.

*It is easier for some employers to allow the first-hired technician to go for six weeks rather than allow the manager to go for six weeks. Sometimes the technician is capable of growing into a manager, sometimes he is not.*



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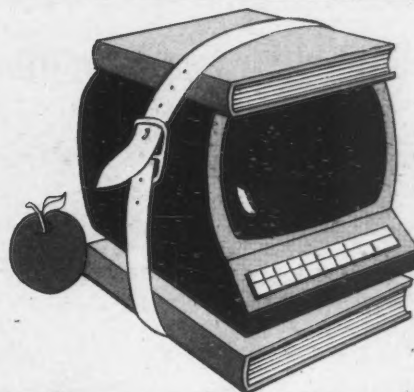
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## IN DEPTH/BUTTERFIELD INTERVIEW



## An interview: Bill Butterfield

### How does Share deal with IBM?

The most formal way we have to deal with IBM is through the requirements process. That process is basically the same as Guide's. We have around 4,500 to 4,600 requirements in a data base. About three-quarters of those focus on specific products. In other words, Share says, "Something is wrong with X," and IBM responds by saying, "Yes, we recognize that, and we're going to fix it," or "We're thinking of fixing it."

The other quarter of the requirements are not exactly product specif-

ic. For example, we'll say, "Gee, wouldn't it be nice if this product and that product went together in this way."

We have good communication. Share and IBM are on-line to a requirements data base. Of course, you never get confidential responses as part of that dialogue. As people walk through scenarios within the projects, obviously you have to discuss the framework of different kinds of solutions. So that dialogue goes on all the time.

Beyond that, of course, IBM furnishes speakers for Share meetings. I think at our last meeting in Miami, IBM provided about 100 speakers out of 800 total sessions. Some were product-oriented, some direction-oriented.

### How do you make sure Share

meetings do not become marketing-oriented?

There are three kinds of pitches at Share meetings: IBM pitches, customer pitches and vendor product presentations.

We really don't want marketing pitches. When a project sponsors an IBM pitch that is too marketing-oriented, we raise a flag and say to IBM, "Hey, this is really an inappropriate pitch." That is usually taken care of by the project manager.

Customer pitches, on the other hand, are often very straightforward. He doesn't have anything to sell. He stands up to make a presentation on how to use MVS for graphics. But an awful lot of our members, and certainly a growing number of them, are themselves vendors.

Boeing Computer Services Co. and Martin Marietta Data Systems, Inc., for example, are members. A lot of consultants, who are attending under their company's installation code, have themselves to sell.

When anyone who is a vendor of a product is talking about that product, even in the most technical kind of presentation, we call that a vendor product presentation. There is a policy covering that kind of presentation, such as the text of the presentation must be submitted and reviewed by a couple of layers of management. If it looks too marketing-oriented, we'll kill it.

We really try to ride herd on marketing-oriented pitches, because that is not what we're here for — to become a showcase for a product.

**You are just finishing a two-year term as president of Share. How much time did it take away from your job at General Motors?**

GM is happy to have an employee back. The commitment I asked GM for was 50%. That included all the travel and attendance at Share conferences, special planning meetings, meetings with IBM executives and attendance at Guide [we do interchange visits]. The travel adds up to about 25%. The other 25% is stuff I do back here. I said that anything above 50% I would do outside of working hours. I have stayed right within that 50%.

We have had presidents in the past who have said, "This is going to be a full-time job" and have asked for a leave of absence or a 90% commitment. There is a real disadvantage to that kind of commitment. You can put a lot of demands on the people who support you if you aren't careful. You can burn them out really fast or make them hate the fact that they ever made the commitment.

So I think you have to balance the situation. Share asks for somewhere around a 25% to 35% commitment from our officers, and we ask for about a 20% commitment from the directors. A few key people, such as the director of divisions, are sitting right around 35%.

**Does that make it difficult to get good people to join Share activities?**

Share has been more of a technical organization than Guide. Younger people, with more heavily technical backgrounds, attend Share meetings. In the past it has not so much been the level of commitment that was the

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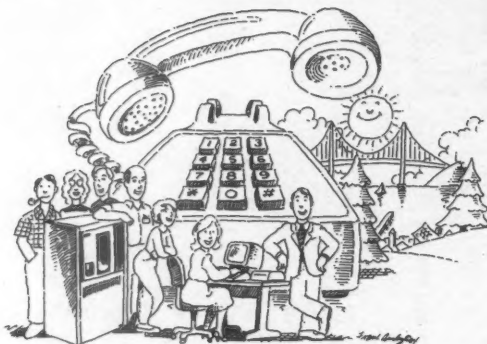
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## IN DEPTH/BUTTERFIELD INTERVIEW

problem, it was the fact that the person really liked being a project manager and didn't really want to advance in the organization.

I think, by and large, that problem is gone. The last two slates for office have been almost fully contested. During my two years as president, it has not been difficult to get people to serve in key positions, like division manager and deputy of managers. Right now, people feel good enough about Share that we don't have any problems.

**How do you make sure Share meetings provide helpful information to both large and small users?**

I guess that is always a real challenge. Let me take, as an example, one of the groups that I think does a dandy job of that. That is the VM group. There are six or seven ongoing projects in the VM group. There is a whole range of projects there. For example, some are very advanced, focused projects, but there is a new users project as well. The MVS group is structured in roughly the same way.

Our group structure is delineated by the audience. Groups don't try to be everything to everybody. They have charters and areas of responsibility.

We are not carved up, like Guide is, into a working part and an open part. We offer intermixed tutorial and working project meetings throughout the week-long meetings. You can come to Share if you are new to some particular area, and you will surely find a program or tutorial that interests you. What we hope is that someday you will get to the point where you will want to come back and participate actively.

**Is getting the user back the second time difficult?**

On our registration form, we ask if you have attended a Share meeting in the last three years. If you haven't, we consider you a first-time attendee. We get somewhere between 25% to 30% "first-time attendees" per meeting. So we do have some degree of turnover. But we have a working category that is big enough to sustain our projects on an ongoing basis. And we have people who come back regularly and never work on projects.

**Is it difficult for users to get the commitment from their employers to participate actively in Share?**

I think the Share conferences are a fairly popular conference for employers to use as a reward. We hear a lot of "this is my time to come to Share, and I won't be back for two years." A lot of people come through like that. That makes it hard to get a continuing commitment. For example, GM sent 10 people to the last Share meeting. We have a staff of about 300 people. Not including myself, two of those 10 are active members of projects that get to go back every time and participate in those projects. Eight were kind of passing through. Some of those eight will go back six months from now for another major meeting, but they won't go back with the goal of working. They will go back with the goal of collecting information in the data base area, or whatever.

Many companies seem willing to

*I think the Share conferences are a fairly popular conference for employers to use as a reward. We hear a lot of "this is my time to come to Share; I won't be back for two years."*

say, "I will let two of my employees participate and support the organization by taking an active role in projects, and we will make a continuing two-year commitment."

**Sometimes companies are more willing to send systems programmers to a meeting rather than a manager. Is attracting high-level DP executives at Share a problem?**

Yes, getting them to participate in Share becomes difficult. We have

tried various forums to attract managers. We have something we call Exec-u-session, which works well. When we are in a region, we invite the bosses of all our ribbon wearers or the chief DP guy to come in and sample Share.

We have also tried an ongoing executive topics forum. We have been able to build enthusiasm in it, and then it tapers off, maybe after a year or so when that group of people seems to be milked out.

We haven't found any effective

way to roll that process over and sustain it on an ongoing basis. You seem to get promoted out of your ability to attend and participate in Share.

**What is Share's involvement with outside organizations, such as the Ansi and ISO standards committees?**

We are quite active. We have a voting membership on the X3 committee. We are in the process of recruiting a person to serve on Spark, the steering committee for Ansi. We have a very active manager of standards who, each year, gets 150 documents that are relevant to Share activities. He circulates those documents to the right projects for comments and then sends that information back to the standards world.

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## IN DEPTH/BUTTERFIELD INTERVIEW

**How much influence does Share have with organizations like ISO and ANSI?**

I think we have a decent reputation technically, so I think we have had some substantial influence. PL/I is a prime example. Share has been active for years with PL/I standards. It is our participation on technical committees that really gives us our influence.

**How much influence does Share have with IBM?**

I think we have a whole bunch of influence. More in recent times than historically because we and IBM have managed to do a better job of understanding each other and working in a business relationship.

Share's tendency has been to keep

*Some talk by a Share president gets incredibly misquoted or misunderstood, and it is made the topic of headlines. Another part of our aversion is that we have no real desire to go fight with IBM through the trade press. We don't have much leverage there.*

IBM a little bit at arm's length. We do not want them in our hip pocket, nor do we want to be in their hip pocket. We want to present a proper customer view, in some sense influenced by what IBM says is the current strategy.

Take VM, for example. I think Share was singularly responsible for twice turning around IBM's direction on VM. IBM was about to kill it

twice. They failed both times, and I think Share was principally responsible for that — along with a ton of customers who were voicing their concerns through Share, as well as individually.

Another strategic requirement I can think of is the Large Systems Requirements for Application Development report, which really laid out much of the functionality of MVS/

XA. That was done almost four years ago, so it has had a long-term impact. But I think that report had a lot to do with influencing IBM to take the direction they have with MVS development.

More recently, there was the Software Service Task Force report, which laid out a whole ton of short-term service considerations and long-term quality considerations. I think that report has had a substantial impact. The final response that IBM put together represented eight separate IBM divisions, some of which, we have the suspicion, had not been talking much with each other.

The report forced IBM to look at a package of issues because we, as IBM customers, wanted a strategic approach rather than individual, divisional approaches. There were something like 14 toll-free numbers you had to call for service from IBM. This report pointed that out and said, "Wouldn't it be nice if we only had to call one." IBM looked at that and said, "That makes sense — we just never looked at it that way before."

**Have you noticed a difference in the way IBM deals with its customers since John Opel took over as president of IBM?**

Yes, I have noticed a difference. I guess I probably should attribute it to some extent to John Opel's influence. But I think a lot of things have happened. Things have definitely changed.

For example, IBM is going to customers before products get locked in and saying: "Hey, we're thinking of doing X, and we can do it in two ways. Which do you think makes more sense to you?" There was a time when IBM never engaged in those kinds of discussions. I don't know whether it was the influence of the previous IBM management, the antitrust stuff, the lawyers or whether it was just that IBM believed they always had the right answer. I suspect it was pieces of all of those. In any event, dialogues go on today that never would have gone on seven or eight years ago. These are very valuable dialogues, by the way.

I really think IBM has become a more open company. I guess they've experimented and decided it is good business to be in touch with what your customers are doing.

**Both Guide and Share have traditionally been shy about dealing with the trade press. Why?**

The things that come to mind are a whole bunch of horror cases that have happened over the years. Some talk by a Share president gets incredibly misquoted or misunderstood, and it is made the topic of headlines.

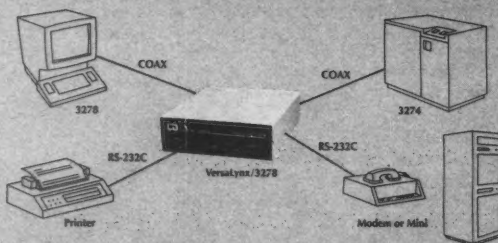
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## IN DEPTH/BUTTERFIELD INTERVIEW

*There was a time when IBM never engaged in those kinds of discussions. I don't know whether it was the influence of the previous IBM management, the antitrust stuff, the lawyers or whether it was just that IBM believed it always had the right answer.*

So I think some of our aversion is to that. Another part of our aversion is that we have no real desire to go fight with IBM through the trade press. We don't have much leverage there.

IBM is not a monolith. There are always factions in IBM around any issue of substance. We think our most effective way of working with IBM is to find our friends and give them all the information we can to assist them in getting our views

across. They may win or lose, but there is no added benefit to IBM relations by taking the issue to the trade press.

**You stated earlier that IBM does not come to either Guide or Share to preannounce products. What is the advantage of being a Share member? Do Share members get any special treatment from IBM?**

You mean back at the

ranch?

**Yes, in terms of service and one's selection as an early delivery site, for example.**

I think it is possible to become an early delivery site through Share. Both the IBM development laboratories and the National Accounts Division people are involved in Share and Guide. I think if you are active in an area and you have demonstrated a knowledge and expertise in that area, you might go on a tentative list if IBM has a real product to offer. Now I believe, from my experience at GM, that fundamentally the nomination process is still run by the local branch. So everything else has to be right at the branch.

The other thing that happens with Guide and Share participation, of course, is that you build up a set of contacts, and there are a lot of informal opportunities for discussion. When a bunch of technical people get together and start talking technical issues, a scenario for what's going to happen in the future will certainly come out. I mean they don't come out as product announcements, tidbits or directional statements. But if you are talking with someone who is an IBM development planner in some area and he asks you some questions, he's asking because that's the direction IBM is looking at, or he's asking because IBM is not looking at that direction and he has some concern that maybe they should be. That is the kind of exchange the people who regularly participate in Share get more often than the casual attendee.

**Can your involvement with Share go against you in dealing with IBM?**

I have never heard of that being a problem. I've never had to sit on anybody at Share for beating up on IBM. The key point is that this is a business relationship — you can disagree without being disagreeable.

**IBM has accelerated its product introduction schedule over the past few years. Has that changed Share?**

You're focusing on the hardware part of the story. You will not find a heck of a lot of discussion in Share anymore on the hardware or hardware families. I think it is certainly true that the tendency has been for a family of products to show up and for upgrades to be available within that family. So while the density of announcements has increased, I think much of that has tended to be evolutionary rather than revolutionary. The revisions between families have not been exactly clear. For

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## IN DEPTH/BUTTERFIELD INTERVIEW

*I think it is possible to become an early delivery site through Share. If you are active in an area and have demonstrated a knowledge and expertise in that area, you might go on a tentative list if IBM has a real product to offer.*

example, you have changes in generations of hardware without changes in generations of the systems software on that hardware.

In the software arena, there has been definite change in Share. There is a much greater concentration on what are IBM's strategic products that are going to proceed in an evolutionary way. And Share tries to put its resources into those strategic products and directions to have an impact and an

influence on them.

**With IBM's rapid-fire product introductions, do you find it more difficult for Share to prepare formal positions on a product before that product becomes outdated?**

That is one of the reasons electronic conferencing is of value. We do most of our white papers, strategic stuff, task forces and projects using our conferencing facilities.

ties. They help us get stuff done in a third of the time it took us with the old way of writing stuff, mailing it and holding periodic meetings.

**Do you find Share members are putting a heavier emphasis on capacity planning?**

Definitely. One of our really good projects is called the Computer Management Evaluation Project. The kinds of papers that are contributed to that project show that a lot of people are much more interested than they were a while back.

The other thing is that the system is no longer the boxes that sit on the user's floor. The system is everything that connects to those boxes. I don't quite know how to do capacity planning in the face of that. For example, what if I install 1,000 personal computers, not just IBM, but lots of different kinds of personal computers, installed on people's desks for different reasons. I have some guess what that might do to my data base, but I haven't the faintest idea what it is going to do to my mainframe. The added dimension, of course, is network capacity planning and integration of local-area networks and all the other types of networks you get into.

The new thing I've seen emerge in the past three or four years is the concept of enterprise capacity planning. For instance, what is the total amount of computing I need within my enterprise this year and the next?

**What worries you about Share?**

I guess it is the potential for growing in size that worries me most. If you plot our growth over the last several years and on into the future, in a few years we are not going to be able to conduct Share in the way we do right now. And it is not clear we have an alternative.

The use of automation is another area I am very concerned about. Can we employ the right method to continue to have the leverage we need for the future?

It is becoming hard to get volunteers because the skills are becoming more specialized. I now have a person whose specialty is electronic publishing. We're trying to develop good-quality publications. We are also studying how we might use conferencing to provide information exchange and access to our entire membership.

Right now, I think Share is clearly meeting the needs of the membership. So while I still have a lot of people who come in and I never see again, I have a lot more people than I did before who are willing to work and contribute to the organization.

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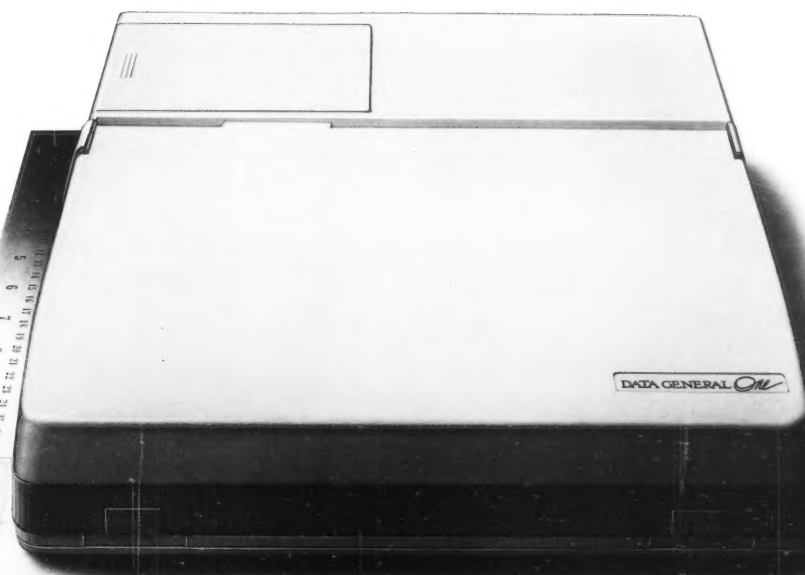
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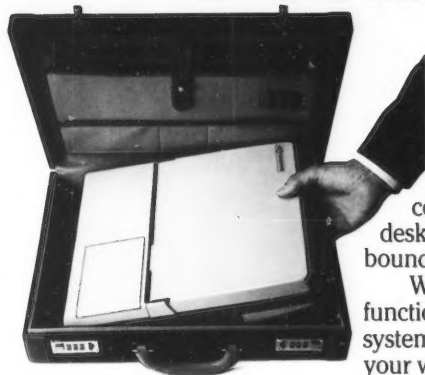
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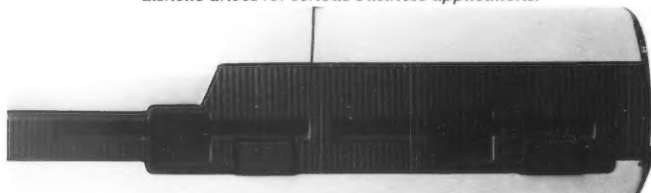


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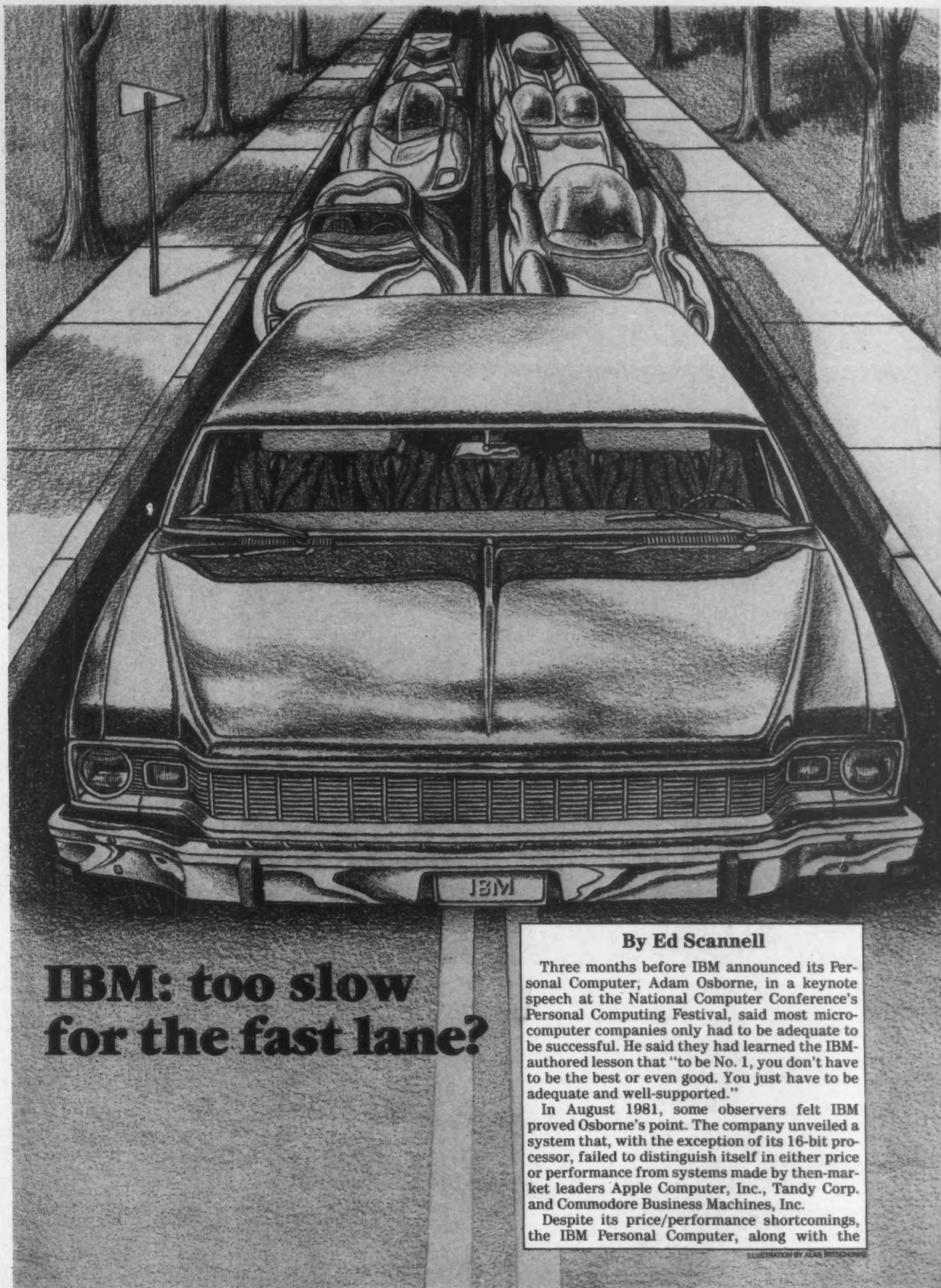
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# IN DEPTH



## IBM: too slow for the fast lane?

By Ed Scannell

Three months before IBM announced its Personal Computer, Adam Osborne, in a keynote speech at the National Computer Conference's Personal Computing Festival, said most micro-computer companies only had to be adequate to be successful. He said they had learned the IBM-authored lesson that "to be No. 1, you don't have to be the best or even good. You just have to be adequate and well-supported."

In August 1981, some observers felt IBM proved Osborne's point. The company unveiled a system that, with the exception of its 16-bit processor, failed to distinguish itself in either price or performance from systems made by then-market leaders Apple Computer, Inc., Tandy Corp. and Commodore Business Machines, Inc.

Despite its price/performance shortcomings, the IBM Personal Computer, along with the

ILLUSTRATION BY ALAN WITSCHONKE

## IN DEPTH/TOO SLOW FOR FAST LANE?

Personal Computer XT, owned a 22% share of the market, racked up more than \$2 billion in sales and had become the de facto standard in the business market all by the end of 1983. The systems also created an industry within the industry of compatible makers content to be "adequate" and draft off IBM's success.

Because of IBM's unwillingness to produce more innovative products, some have begrudged the company its seemingly effortless success in the microcomputer market. A number of observers feel that a company with a research and development budget that exceeds the total revenues of some of its competitors should produce a more technologically sophisticated system.

They see no justice in much smaller, more adventurous companies suffering the bruises of exploring new

technologies and markets only to lose market share when IBM enters the market with what is usually a less ambitious product.

Besides being an opportunist, IBM has retarded the progress of technology, its critics say. Any business product IBM produces is bound to be successful. The company's Fortune 1000 following, which has invested millions of dollars in IBM mainframe hardware and software, will consider only IBM microcomputers.

It follows that even the most inventive software and hardware developers have been drawn away from the more sophisticated products and toward the Personal Computer. Without the help of these third-party developers, IBM would have been locked out of many of the vertical markets it has so successfully penetrated. Those defending

IBM's technology say that because of economies of scale, the company had little choice but to base the Personal Computer around Intel Corp.'s 8088 architecture.

"IBM isn't necessarily trying not to be innovative. However, IBM has a problem in that as soon as it announces a product, the whole world is going to try to buy it," said Alan McAdams, a Cornell University economist who served as a consultant to the Justice Department in its antitrust suit against IBM. "For IBM to get a product delivered from zero to huge volumes overnight, it had to select a whole series of off-the-shelf components that could be produced by others. The product is mediocre because that is all they could pull off the shelf," he explained.

To IBM's credit, the Personal Computer AT, unwrapped last August on

the third anniversary of the original Personal Computer's introduction, is as close as IBM has come to technology's razor's edge. Considered by most analysts to be a "next-generation" machine, the Personal Computer AT's basic configuration contains Intel's 80286 multiuser chip, which is two to three times faster than the 8088, stores 256K bytes expandable to 3M bytes and is priced at \$3,995. This is a vast improvement over the basic version of the original Personal Computer, which had 16K bytes of memory, expandable to 256K bytes, and was not price competitive.

## Nonstandard standard

McAdams and other industry watchers would have no problem with the Personal Computer serving as the industry standard if it were a true standard. They contend that IBM has purposely made the machine a "nonstandard standard." By not revealing all of the system's microcode, the company is making it unnecessarily difficult for others to compete.

"It is useful to have a standard if everyone can produce to that standard, allowing the company with the product that best meets the interface requirements between hardware and software to win in the marketplace. However, that is not permitted to happen," McAdams contends.

"If someone tries to use the same microcode, then IBM sues them for violation of trade secrets. In a really competitive market, you wouldn't have these artificial legal constraints," McAdams said. He points out that such lawsuits have been effective weapons against cash-poor start-ups.

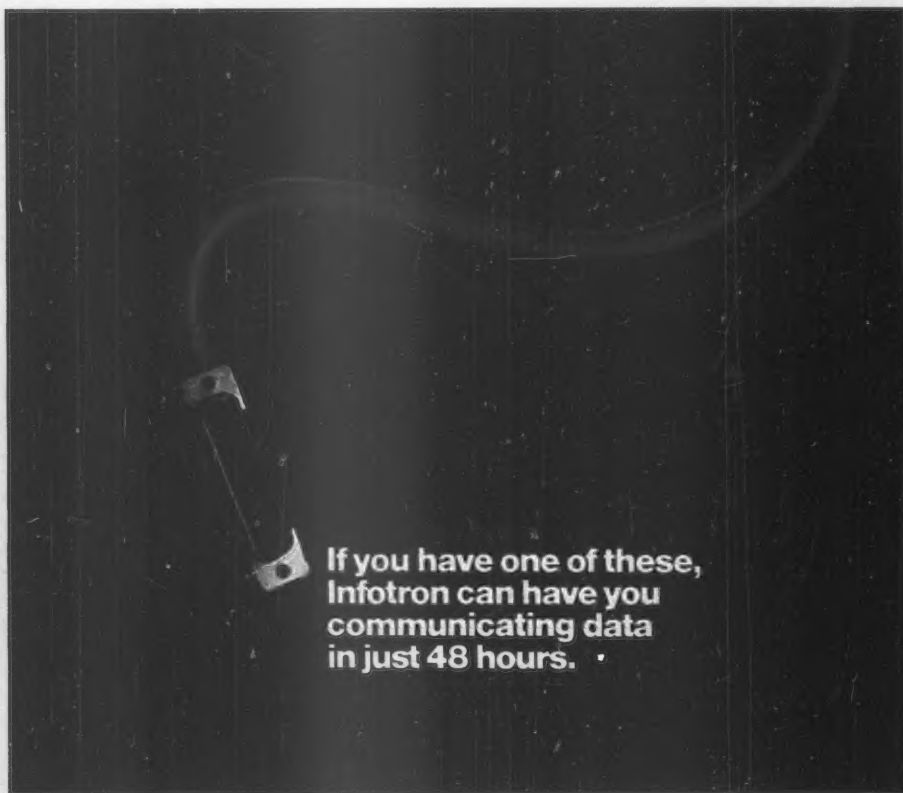
Some analysts predict that once IBM reaches the point where it so thoroughly dominates the market it no longer needs the software and hardware enhancements of third parties to be successful, it will encrypt the Personal Computer's interfaces, making it impossible for the compatibles to compete. This was a tactic the company used against its competitors in the mainframe market.

These analysts also think IBM will put "mid-life kickers" into its microcomputers to shake the competition. A mid-life kicker, according to McAdams, is a hidden capability in hardware that the company can "turn on" with a minor enhancement when a competitor comes up with a similar function.

"My anticipation is that IBM will play [in the microcomputer market] all the dirty tricks it played in the mainframe area if it needs to. If it doesn't have to, it will be a statesman-like company. But if IBM is pressed, it will do what it has to do to dominate that market," McAdams said. "If you are a micro maker trying to be plug-compatible with IBM, the history is not good," he asserted.

Rick Scott, a spokesman for IBM's Entry Systems Division, said IBM has no plans now or in the future to keep compatible-makers and third-party developers at arm's length by closing off the system. "Don Estridge [president of the Entry Systems Division] has stated many times our intention to stay with the open architecture. It has been very good for IBM and our customers," Scott said.

Another advantage IBM is beginning to use against its smaller competitors is donating large numbers of



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## IN DEPTH/TOO SLOW FOR FAST LANE?

Personal Computers to universities and high schools. The benefits of such giveaways are twofold: first, experienced university teachers and students are given the opportunity to develop innovative, Personal Computer-compatible programs; and second, first-time users are offered the chance to train on IBM systems. These users, once they enter the work force, will probably prefer IBM's systems over a competitor's.

The government eventually halted IBM's donation of mainframes and minicomputer-class systems to schools because it did so to the de-

*Besides being an opportunist, IBM has retarded the progress of technology, critics say.*

gree that others couldn't match. The government ruled it was an artificial way of stimulating demand for IBM products.

While encrypting interfaces and making generous donations to schools are tactics IBM might use in the future to stifle competition, a more immediate weapon is pricing. Several analysts have already predicted that one or two more across-the-board price cuts similar to the 18% to 23% cuts made in June will force many competitors to seek the refuge of Chapter 11.

"Many compatible makers have some good products, but they don't have the level of profitability to withstand an intensely competitive price war," said Joan McKay, a securities analyst with Kidder-Peabody & Co. "In terms of investment, I wouldn't go near any of them," she said.

Since the Justice Department dropped its antitrust suit two years ago, IBM has exhibited some of the most competitive pricing behavior in its history. For the first time, particularly during 1984, IBM has shown a willingness to cut prices and current profits to gain higher market share in the future. This is a dramatic departure from its mainframe days when it could be brought to court for keeping prices too high.

Most analysts agree that the only thing that will stop IBM from leveraging its considerable resources is legitimate competition. With the possible exception of Compaq Computer Corp., analysts have ruled out any serious competition coming from the compatible makers. The vast majority of compatible manufacturers are barely profitable or awash in red ink.

"It is certainly impossible for a company of our size and position to set technology standards in the marketplace," said Dan Carter, president of Corona Data Systems, Inc., a compatible maker whose systems run 98% of all Personal Computer programs. "We can still do some innovative things, but you still have to work within the framework of what is being dictated by the big guy in

the marketplace," Carter added.

If IBM is to get any serious competition, most analysts say it will come from AT&T. AT&T finally entered the microcomputer market this past spring with a series of multiuser systems that use the company's proprietary, 32-bit Bellmac chip and a low-end Personal Computer clone. While it can certainly match IBM's financial and manufacturing resources, most analysts feel the company has too much to learn about the marketing aspects of microcomputers to be any kind of short-term threat.

"AT&T has to learn the business. It has to be focused, and it is not a focused company," one analyst said. "I don't know if it can get focused quick enough to be a major player in the marketplace," he said.

If neither the compatible makers nor AT&T are able to create any pressure, analysts feel that the only other source of competition is the Japanese. However, like AT&T, they have much to learn about the constantly evolving technological and marketing trends of the U.S. business market.

"I suspect that the pace of change in the business market will continue to be faster than the Japanese can keep up with," said Kenneth Bosomworth, president of International Resources Development, Inc. in Norwalk, Conn. "The Japanese will probably continue to make bad choices, such as trying to distribute personal computers through office machine dealers, which is a ridiculous idea. The Japanese won't become a factor until innovation slows

*Those defending IBM's technology say that because of economies of scale, the company had little choice but to base the Personal Computer around Intel Corp.'s 8088 architecture.*

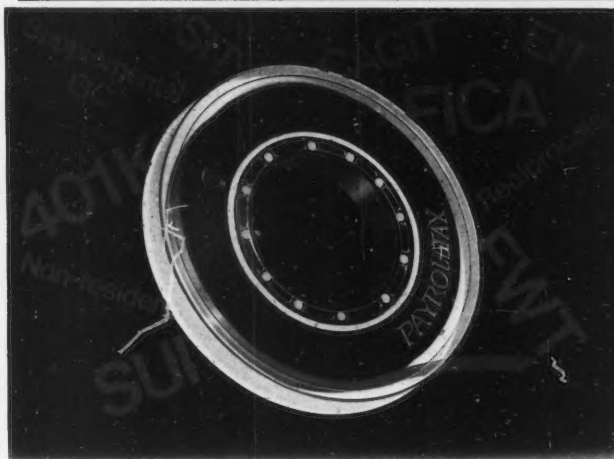
and standardization takes over," Bosomworth remarked.

Despite its menacing presence in the market, even those that feel most threatened by IBM can find some good things to say about the company. Many have faith that IBM will be a benevolent dictator, that it will continue to create more business than it will take away.

"IBM certainly has brought some sense of continuity to an industry that was flung all over the place before the introduction of the Personal Computer," Corona Data System's Carter said. "If IBM had not standardized and opened up the architecture of the machine, there would probably be 200 companies that would not be in existence today," he added.

#### About the author

Ed Scannell is a senior writer for Micro Marketworld magazine in Framingham, Mass.



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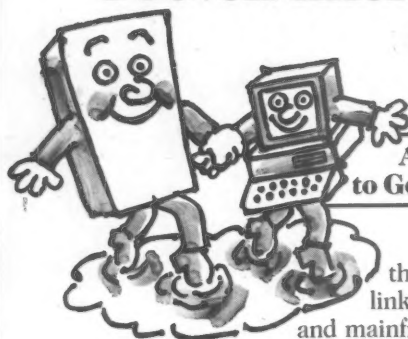
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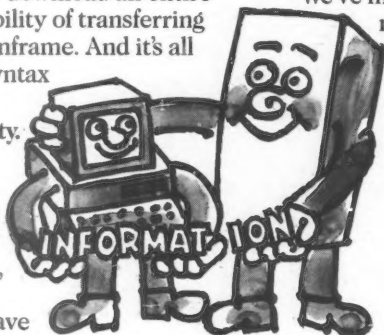
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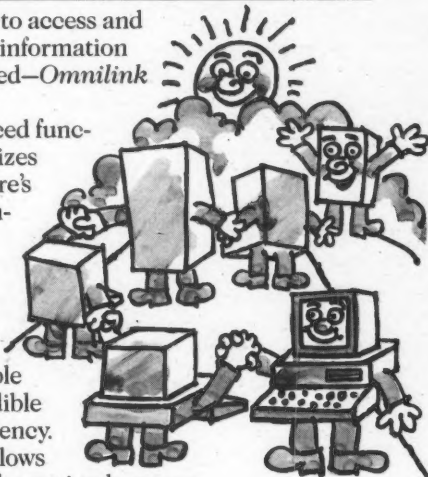


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## IN DEPTH

# Handling data integrity in relational DBMS

By V. Venkatakrishnan

*Without the general integrity features, the relational data base degenerates into a mere tabular structure, no different from the traditional flat file of the pre-DBMS era. Projection becomes file extraction and join becomes file matching! What is worse, the tabular structure without the integrity constraints suffers from both poor performance and invalid data.*

This is the year of the relational data base management system (DBMS). Leading vendors are announcing finished products based on the new technology. Relational DBMS are said to be more user friendly than their hierarchical and network counterparts because of the absence of any navigational requirements and the ability to join dynamically several records into a single logical view.

Experts hotly debate the performance implications. But those implications will be clear only when results from actual large-scale usage become available.

The attention paid to the performance issue is hardly surprising. What is surprising is that the complementary issue of data integrity is seldom mentioned.

The Relational Task Group of the American National Standards Institute has several criteria for labeling a DBMS "relational." These may be summarized as follows:

1. The data base is represented in the form of two-dimensional tables.
2. There are no navigational requirements imposed on the user.
3. Any number of tables may be dynamically joined or projected.

Commercially available relational DBMS satisfy, at least technically, all these requirements in varying degrees. These are, however, the minimum requirements of a relational model, which also insists that the two general integrity rules must be obeyed.

Without these integrity features, the relational data base degenerates into a mere tabular structure, no different from the traditional flat file of the pre-DBMS era. As a consequence, projection becomes file extraction and join becomes file matching. What is worse is that the tabular structure without the integrity constraints suffers from both poor

Line item number 1	Quantity ordered 1	Quantity shipped 1	Line item number 2	Quantity ordered 2
572	20	20	575	40
572	90	90	777	50



## IN DEPTH/DATA INTEGRITY

Order	Order detail
<u>Order number</u>	<u>Order number</u>
Date of order	Line item number
Date of shipment	Quantity ordered
Customer number	Quantity shipped

Figure 1

performance and invalid data. Ironically, the more conventional hierarchic, network and even the traditional flat file structures easily provide for these constraints.

The first rule, called the entity integrity, states that the primary key of an entity cannot have null values (zero or spaces). The primary key of an entity is that special attribute that uniquely describes a single occurrence of the entity. It is implied that data is normalized and does not contain any repeating groups. The second rule is known as referential integrity. Stated simply, it requires

that if a data element is shared between two or more entities then the occurrence of the values for this element must be consistent between these entities.

The rationale for the entity integrity is fairly obvious. By definition, the primary key value uniquely identifies one occurrence of the entity. This is impossible to accomplish if null values are permitted. In the DBMS available today, entity integrity can be enforced through proper data base definition. In order to understand the referential integrity, consider the two entities order and order detail. Assume that they are both normalized to the third normal form (Figure 1). This means:

1. They do not contain repeating groups.
2. There is no partial dependence of attributes on the primary key.
3. There is no transitive dependence between the nonkey attributes.

In Figure 1 the primary keys are shown by underscoring. For each or-

Order relation (values for attributes are repeated)						
Order number	Date of order	Date of shipment	Customer number	Line item number	Quantity ordered	Quantity shipped
123	840510	840515	3695	572	20	20
123	840510	840515	3695	575	40	30
123	840510	840515	3695	621	90	89
333	840520	840520	3279	572	90	90
333	840525	840526	3279	777	50	48

Figure 3

der there can be several order line items, say an average of 10. Order number is the common data element that is the primary key in order and is part of the concatenated key in order detail.

A user entering order line details must specify both the order number and the line item number to enter the details such as quantity ordered, shipped and so forth. If a value of 255, for example, is entered for the order number in Order detail, then the referential integrity requires that the order entity must have at least one occurrence with the value of 255 for the order number.

If this integrity is violated, we have a serious problem of "orphan orders" — line details without corresponding orders and vice versa. Proper internal controls must be built and maintained by users to

avoid this trap, which can be quite expensive if it is not recognized early.

There are literally hundreds of situations where the exposure is more subtle than this but just as severe. In the hierarchic and network DBMS this exposure can be avoided by selecting the suitable options for the linkage between the two entities so that line details can be added only after corresponding order information is entered. By contrast, in relational DBMS there is no linkage between the two entities and the integrity becomes the sole responsibility of the user. If unnormalized data is used, the problem is compounded with performance degradation.

Two-dimensional tabular structures do not allow repeating groups for the simple reason that

Order relation (null values for attributes used)						
Order number	Date of order	Date of shipment	Customer number	Line item number	Quantity ordered	Quantity shipped
123	840510	840515	3695	572	20	20
—	—	—	—	575	40	30
—	—	—	—	621	90	89
333	840520	840520	3279	572	90	90
—	840525	840526	—	777	50	48

Figure 2

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## IN DEPTH/DATA INTEGRITY

they add a third dimension. There are basically four ways of "flattening" the repeating groups so that they can be accommodated into a two-dimensional table:

1. Substitute nulls for values of nonrepeating attributes (Figure 2).
2. Repeat the values of nonrepeating attributes (Figure 3).
3. Make each repeating attribute a distinct data element (Figure 4).
4. Normalize the data (Figure 5).

The first method violates the entity integrity by allowing null values for the primary key (order number). As a consequence, if the user issues a select or join command involving this entity all the records with null values for the order number are ignored. A join involving tables with null values for the joining operand will result in the inadvertent elimination of these records, thus seriously affecting the integrity and usefulness of the operation (Figure 6).

The second method does not violate the entity integrity. There are other problems, however. Curiously, these problems dramatically impact performance by unnecessarily increasing space requirements for data storage.

The need for more space, in turn, increases the I/O activities and the core requirements because of larger buffers needed to accommodate redundant data. Performance will suffer as a result.

The third method also preserves entity integrity but suffers from problems similar to those of the second method. An added concern is that we do not know how many line details will be needed for each order. Usually a large number is chosen, resulting in wasted space and the attendant problems.

Normalization is generally the best method of flattening the repeating groups. In the normalized structures, only the keys are stored redundantly, and the impact on performance is minimal.

#### Role of data model

The discussion above points to the critical role played by the subject data model in preserving integrity in a relational environment. In fact, the data model is the most accurate representation of both the entity integrity and the referential integrity constraints. Entity integrity is characterized by the primary keys of the entities; the referential integrity constraints are mapped by the association between the entities.

In our example, the association between order and order detail is said to be "one to many." This means that for each order there may be one or more order line details.

For a specific order line detail, however, there must exist one — and only one — order. Both the data contents and the integrity constraints from the data model are used in the physical design of the data base. The exact mode and syntax used in the design is specific to the DBMS environment.

The implementation of the integrity constraints under the flat file, hierarchic and network architectures will be briefly described first in order to appreciate what is involved in the relational environment.

#### Nonrelational architectures

In the traditional (non-DBMS) flat file environment, the order file will contain order detail as a repeating group. A typical implementation may

Order relation (repeating attributes made data elements)												
Order number	Date of order	Date of shipment	Customer number	Line item number 1	Quantity ordered 1	Quantity shipped 1	Line item number 2	Quantity ordered 2	Quantity shipped 2	Line item number 3	Quantity ordered 3	Quantity shipped 3
123	840510	840515	3695	572	20	20	575	40	30	521	90	89
333	840520	840520	3279	572	90	90	777	50	48	—	—	—

Figure 4

be a Cobol OCCURS or OCCURS DEPENDING ON clause. The file may also be sorted on order number. Whether the file is accessed sequentially or randomly, the user must have the order record before entering order details. This way the integrity is preserved.

A typical hierarchic architecture is that of DL/1 from IBM. In this DBMS, order will be the parent segment with order number being the

unique key. Order detail is implemented as the child segment of order with or without the unique key of line item number. An update (add, change, delete) of order detail then requires the user to traverse the parent order segment.

In other words, such a transaction is permitted only for a given order, and there is no way of accidentally including line details for nonexistent orders.

As an example of network architecture, consider Cullinet Software, Inc.'s IDMS. The order entity becomes the owner record and the order detail one of its members.

The two records constitute a Coadasy1 set. The membership option of "mandatory/automatic" is chosen for the set.

This means that when a specific order is deleted the corresponding line details are also deleted. Also,

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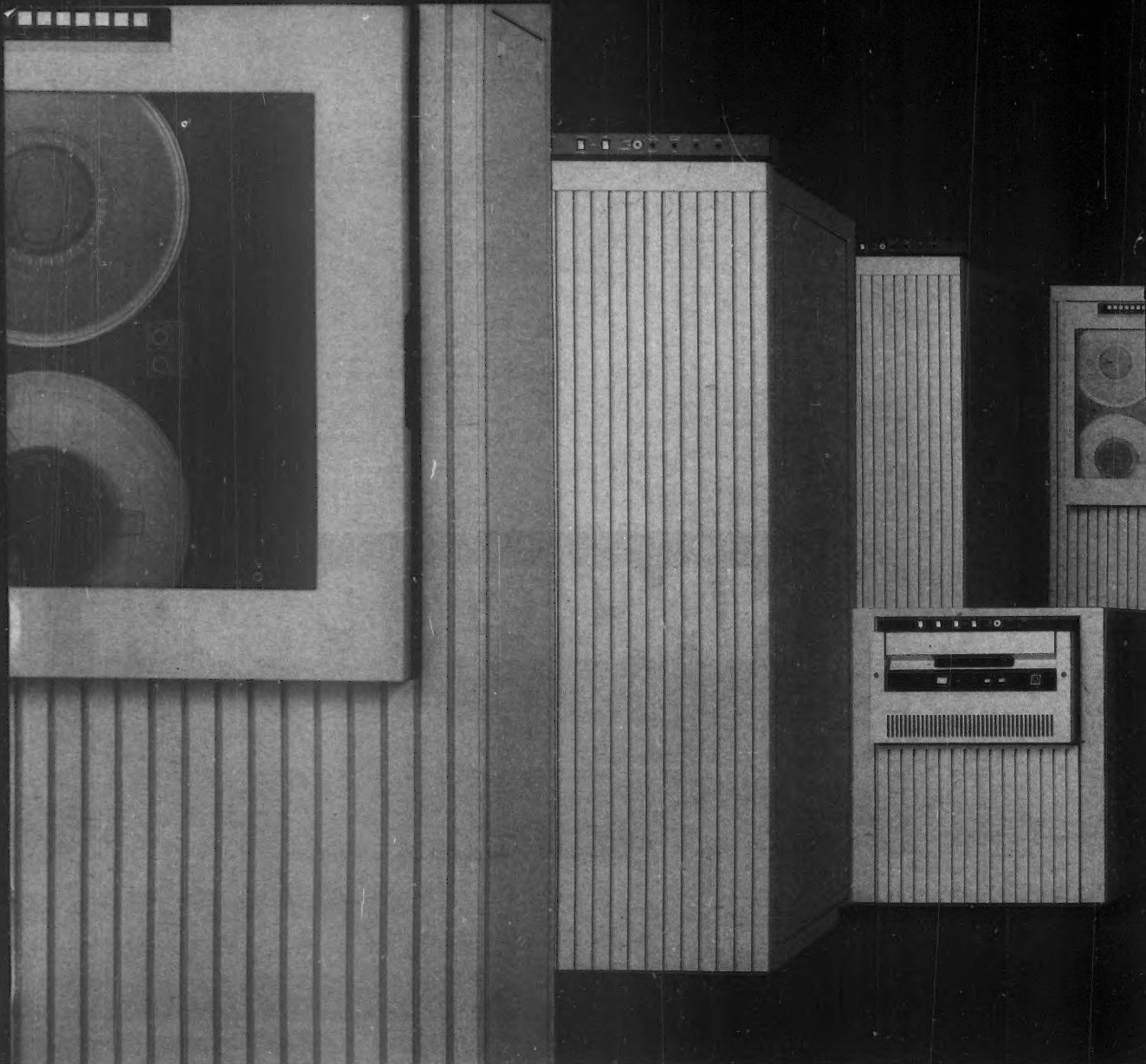
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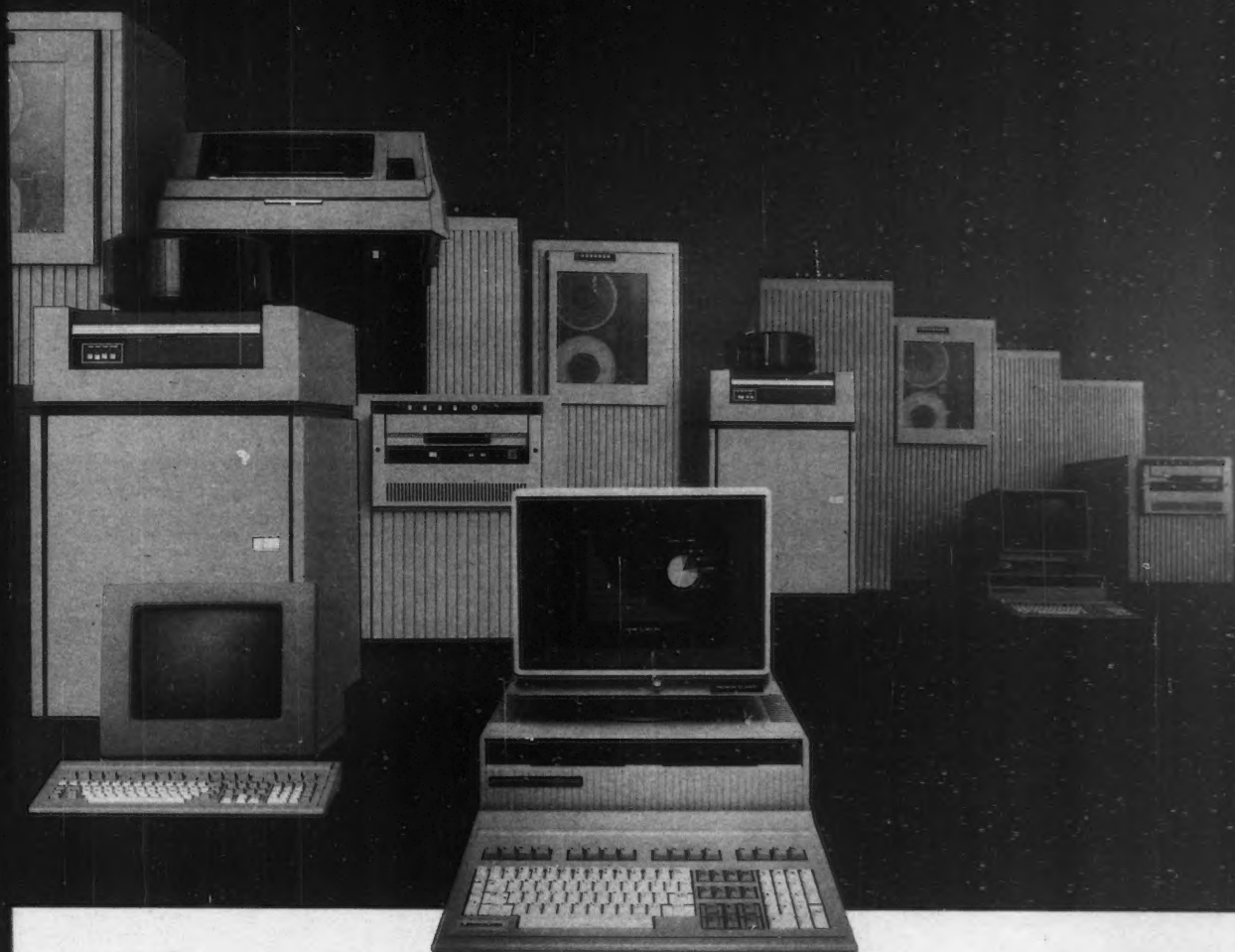
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## IN DEPTH/DATA INTEGRITY

Order relation (third normal form)			
Order number	Date of order	Date of shipment	Customer number
123	840510	840515	3695
333	840520	840520	3279

Order detail relation (third normal form)			
Order number	Line item number	Quantity ordered	Quantity shipped
123	572	20	20
123	575	40	30
123	621	90	89
333	572	90	90
333	777	50	48

Figure 5

Order detail relation (null values for attributes)			
Order number	Line item number	Quantity ordered	Quantity shipped
123	572	20	20
—	575	40	30
—	621	90	89
333	572	90	90
—	777	50	48

Join of order (Figure 5) and order detail above

Order number	Date of order	Date of shipment	Customer number	Line item number	Quantity ordered	Quantity shipped
123	840510	840515	3695	572	20	20
333	840520	840520	3279	572	90	90

Figure 6

updating order detail involves establishing currency (data base position) on the corresponding owner (order) record.

Direct-retrieval access to either record type can be provided. Thus, once again, the integrity is enforced through the DBMS software. Of course, the data administrator has the responsibility of specifying proper parent-child or owner-member options in the data definition language of the DBMS.

By contrast, in relational DBMS there are no user-accessible links between the entities, and the data administrator has no way of specifying the referential integrity constraints. Implementing these vital constraints is left to the application or the person performing update operations on the data base.

In a heavily maintained production environment, the risk of exposure caused by this is extremely significant. It takes only one bad program or a casual user to corrupt the data base accidentally. What is worse is that this condition may not be detected for quite a while, and it may be too late if and when it is detected.

The situation is exacerbated by the fact that the relational architecture is new to the vast majority of installations. Here are some steps that may preserve the data base integrity in a relational environment:

- If possible, limit the scope of data base updates to one organizational unit per entity in the logical model. In this context, adds and deletes are more serious than changes to the data base.
- The data base definition and future changes must strictly follow the formal data model. The consequences of making data base changes without referring to the model can be detrimental.
- All update programs must have specific code to check for integrity constraints as specified in the logical data model. The code does lengthen the program relative to the nonrelational environment. However, reusable (copy library) code may be developed to alleviate the situation.
- Any uploading of data from personal computers must be carefully and strictly regulated. One approach is to make the upload from the micros to trigger a mainframe transaction that will execute the reusable code to enforce the integrity constraints.

Relational DBMS offers more freedom to users. Accompanying this newfound freedom is the responsibility for data integrity.

Regardless of whether this is done through DBMS or application software, without these constraints the data base will fast become a jumble of meaningless values from which no intelligent information can be derived. Deliberate planning and decisive steps are necessary to avoid a catastrophe in what is otherwise a powerful and promising tool.

#### About the author

V. Venkatakrishnan is data administrator in the Financial Division of Aetna Life and Casualty in Hartford, Conn. His responsibilities include building logical data models to satisfy a variety of business needs, integrating logical and physical design in a multiple DBMS environment and providing data dictionary and applications development support.

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# What end users don't know may hurt ~~them~~ you

By I. Steven Kerns

The most obvious and efficient way to begin end-user training is to categorize those users by some natural parameters: by organizational level, by general function, by information-handling function, by requirement for a specific information-handling tool or by skill level. Those categories suggest the best training techniques.

**Organizational level.** Consider the following groupings by job level:

*Executive management.* Key decision makers can benefit from access to timely and accurate information to meet business objectives. But because their day-to-day activities are relatively unstructured, unpredictable and not very repetitive, the discretionary time they have available for education and training is limited. Further, they have the least exposure to keyboards and software packages. Executives are also scattered through an organization. Executives benefit most from computer literacy education, which helps them make decisions about acquiring and using hardware and software not only for themselves, but for their employees.

In providing training for executives, it is crucial that trainers have credibility with an

---

*A skilled user is less of a burden on DP resources. Training experts suggest techniques to help users apply new technology to their jobs.*



## IN DEPTH/END-USER TRAINING

executive audience. At a minimum, comparable experience and a professional presentation establish credibility. The trainer must also be sensitive to the executive's image — executives do not want to appear dumb. Courses or other techniques should be short and self-contained. One user recently developed computer-based training for an in-house time-sharing service. Each segment took approximately 20 minutes to complete.

Course contents must always emphasize the payback for the executive's time. Executives will gladly spend time to be trained if the benefits are clear. Each training session must have a straightforward objective.

**Management.** Many of the current personal computing products provide middle and first-line managers with information and information-handling tools helpful in controlling and directing the day-to-day operations of the organization.

These managers, in order to maintain productivity in their areas, will need skill in operating the technology and in developing an ability to adapt and apply the technology on an ongoing basis. Managers should be able to answer questions from their staffs. Consequently, training for managers will need to be in-depth and aimed at developing skill, in addition to providing information for them to become more aware of the system's potential so they can envision ongoing opportunities for applications. Managers also need information on other training resources to pass on to their staffs.

**Professional and technical staff.** Professional workers perform activities in support of their managers and executives. Their work is unstructured. They themselves have minimal administrative support, so they are most amenable to the introduction of tools to support them. They are often highly self-motivated, with experience using technical tools in their work, so they will easily adapt the tools. Training for professionals should emphasize enhancing skill in operating the technology and provide guidance in how to apply the tools to specific functions (accounting, engineering, analysis and so on).

**Secretarial and clerical staff.** The word and text processing industry has selected the secretarial and clerical roles as the first candidates for automation in the form of improved text creation, editing, data entry and maintenance. More recently, tools to assist with filing, mail, calendars, scheduling, telephone management and distribution have been introduced. Training for secretaries and clerical staff should be geared primarily

toward developing skills in a specific application such as word processing, billing or record maintenance. Training should be provided by skill level — novice, trained and adaptive.

**Function/department.** End users' training requirements could also be categorized in terms of departmental or functional responsibilities (marketing, human resources and so on). This categorization will be increasingly important as

vendors provide products that are functionally oriented.

**Information-handling function.** Because the tools currently offered are still being applied generally, it is easier to categorize the functional requirements by the information-handling requirements of each area. In providing training by information-handling function, a conceptual overview is appropriate in addition to training in how to operate

and apply specific tools. The general information-handling requirements are:

- Document processing.
- Numerical analysis.
- Information retrieval and manipulation.
- Communications.
- Presentation aids.

**Skill level.** Regardless of how end users are categorized — by job level, function or tool required — they must also be categorized by their current skill levels. Training should take into ac-

count whether the user is:

- A novice — has had no contact with computers. Novices may believe they have no technical aptitude and that computers are a threat. The novice category also includes the casual user who will operate a workstation infrequently and will quickly forget how to operate equipment.
- Trained — has used computers and has had training in operating them.
- An adaptor — uses

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## IN DEPTH/END-USER TRAINING

*Because the hardware manufacturers have been under intense competitive pressure, most have unbundled the bulk of customer support. In addition, they have increasingly offered self-paced training aids.*

computers, may have been trained by others or be self-trained and adapts the technology on an ongoing basis.

The sources of end-user training include hardware and software manufacturers, training services and training package vendors, as well as in-house resources.

**Manufacturers.** Nearly all of the end-user hardware manufacturers offer some training for purchasers. This is particularly true of the word processing or integrat-

ed office system products (Digital Equipment Corp.'s All-in-One or Data General Corp.'s CEO). Vendor support for these products includes documentation, manuals and actual training sessions. The training sessions are usually available for only a limited number of employees as a part of the system purchase price. The vendor suggests that it train one employee per system; this employee can then train others. This is a "train the

trainer" approach. Other employees can be trained by the vendor, but at additional cost averaging around \$300 and up per day per employee.

This type of training is good only for those who will actually operate the system or who will supervise operations. Because the hardware manufacturers have been under intense competitive pressure, most have unbundled the bulk of customer support. In addition, these manufacturers have increasingly offered self-paced training aids.

Many of the manufacturers also provide educational consulting services to large purchasers. They will spend time with customer representatives analyzing current skills and identifying necessary new skills. The manufacturers with multiple product lines provide computer literacy courses, which are free to large customers or potential large customers. They also have courses designed for end users as well as computer professionals.

Personal computer manufacturers, however, primarily offer only documentation, manuals and computer-based training aids.

Software vendors typically offer training solutions consisting of various techniques that depend on the cost of the product — the greater the cost, the more comprehensive the training solution; the smaller the cost, the more likely that solutions will be computer-based.

**Training vendors.** The tremendous growth of the end-user computer industry has led to an increase in training service and training package vendors. Both have been established to meet deficiencies resulting from inadequate or insufficient manufacturer training and serve as an alternative to developing training resources in-house.

Training services are offered by individual consultants, small local consulting firms, larger national organizations such as Deltak or National Training Services, Inc. and computer stores such as Computerland and Businessland. These firms offer a variety of training techniques, including one-on-one training, lectures and seminars, workshops where students hear lectures and gain hands-on experience with equipment, and computer-based instruction.

A growing number of companies offer independent study training material only. The most typical independent study training package is computer-based training, although other media such as video are also used.

**In-house training resources.** Recognizing the deficiencies of manufacturers, the perceived higher expense

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## IN DEPTH/END-USER TRAINING

*The human resources department already has the mechanisms for advertising and promoting training and development, perhaps through a company newsletter. Many users feel that human resources staff members make better trainers or training facilitators than MIS staff.*

of training services and the need to provide ongoing, customized training, companies are increasingly developing in-house end-user training resources. These resources include the MIS staff, the information center and the human resources staff. In-house trainers ostensibly know their employees, their corporate culture and the applications of end-user computing such that they can provide the most appropriate form. Programs devel-

oped by in-house staff range from the use of manuals and self-paced computer-based training to large training centers that sponsor continuing programs on computer literacy, skills development and specific applications.

The most commonly used in-house resource is, not surprisingly, the MIS staff. Programmers and systems analysts who have been involved in the development of end-user computing applications or who have assisted

in evaluating word processors or personal computers have been selected to train new users. Use of time-sharing resources is facilitated by one-on-one training from MIS staff and by scheduled workshops that include hands-on practice with a variety of end-user tools. MIS staff may also offer end users self-teaching aids, workbooks and manuals.

In many companies, the information center, a service from the information systems department initially created just for allowing end users access to mainframe computing resources, is now the locus of end-user introductions to personal computing and, in some companies, the locus of word processing system use.

The human resources department is often best able to institutionalize the training. This department already has the mechanisms for advertising and promoting training and development, perhaps through a company newsletter. Many users feel that human resources staff members make better trainers or training facilitators than MIS staff. Of course, they must be trained in end-user computing first, either by MIS or by outside sources. (They needed "train-the-trainers"-type training.)

#### Traditional techniques.

There are three general categories of training techniques: traditional, technological and adaptive.

Since users have a variety of backgrounds and different needs and learning capabilities, many training experts say that unless instruction is one-on-one, training falls short of its goal. In the ideal case, end users have their hands held as they are exposed to new techniques. Each individual could have materials tailored to meet his specific training needs. This probably is the best way to train executives, if the trainer is not only knowledgeable about the use of computers, but can convey how to develop skills, assist the executive in applying software to solve specific business problems and mesh with the executive's personal style.

Unfortunately, one-on-one training can turn into a demonstration only and not provide the trainee with any hands-on experience. With such high labor content, this type of training is probably the most expensive.

One-on-one is particularly effective for follow-up training. Once an end user has gone through initial training and has begun to apply the knowledge on the job, then a trainer can quickly assess progress and guide him to more effective applications.

For larger numbers of trainees, a structured lecture or seminar, combined with hands-on access to personal computers or word process-

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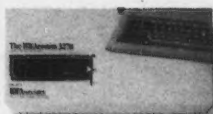




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## IN DEPTH/END-USER TRAINING

ing systems, is cost-effective. The costs include:

- Course fees or instructor salaries.
- Facilities and equipment.
- User training time.
- Travel-related expenses if the workshop is held off-site.

The best workshops provide minimal concept, maximum hands-on experience and an opportunity for the trainee to engage in question-and-answer time with the trainer. The hands-on portion should be performed using a problem the user needs to solve.

A useful instrument that trainees can take away with them is a "cheat sheet" — a single sheet, the smaller the better, that contains the most frequently used commands or instructions, along with space for the user's notes.

#### Technology-based techniques.

With computer-based training (CBT), information and instructional materials are presented in a series of screens, sometimes using text, sometimes graphics. The user responds to the instructions, and the system provides feedback on responses. Material can be designed to let a user select only those topics he needs or wants. The system will wait for his responses, so each student can progress at his own pace. The system can test students on whether they have grasped the concepts or feel they have learned the skills and, if not, the system can repeat the instruction set.

A company may also choose videotape, videodisk or audio-based training products. If developed in-house, they can be tailored to address specific needs and applications. They

provide a high degree of student choice if they are self-paced and are an excellent way to introduce a system.

Unfortunately, these techniques have a one-time cost associated with developing the training packages, and unless production facilities are already available, those costs can be prohibitive.

**Adaptive techniques.** Training experts advocate techniques that help trainees in adapting or applying new technology on an ongoing basis.

Within each group of trainees, one or more students emerge as natural leaders and teachers. They have an aptitude for what they have learned and an ability to pass on their understanding and enthusiasm. These people should be nurtured, because they are invaluable to their peers. Their peers seek them out because they are

accessible, understand their needs and have the same problems to solve.

These users can be given extra attention and training and kept up-to-date on new training materials and new applications. Their use of the new technology will often be the most adaptive and should be shared with others in the organization.

In summary, the goals of end-user training are to develop computer literacy, skill in operation of hardware and software and an ability to adapt new technology to business needs on an ongoing basis.

The primary benefits of end-user training are to reduce the learning curve of new users and to achieve the benefits of the technology more quickly.

End users can be categorized by their job level, their functional responsibilities, their information-handling requirements, the specific tools they need for information handling and their skill level. The costs of training should be included in the overall cost of the system acquired. A cost/benefit analysis is appropriate.

*In each group of trainees, one or more students emerge as natural teachers. They will be invaluable to their peers.*

ate in comparing the cost-effectiveness of one training method over another.

The suppliers of end-user training are varied in quality and in the training techniques they use. Each of the sources has value:

- The manufacturer knows the product.
- The training vendor knows how to train.
- The in-house trainers know the company and the end-user needs and applications.

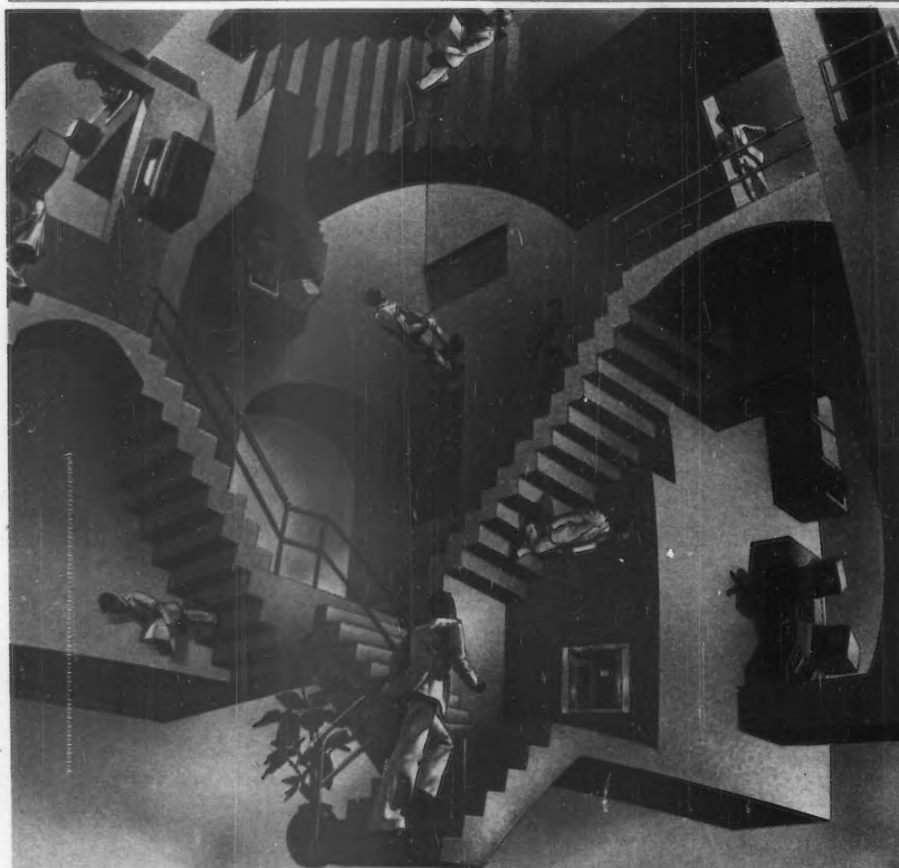
Workshops are cost-effective for training larger numbers of end users, particularly if they can be tailored to those users. Computer-based training is cost-effective, adaptive to individual needs and builds hands-on experience with a system. Other media can also be effective if they are tailored to the end user's needs. Peer training and the learning center build adaptation abilities.

The most effective training will have the following characteristics:

- It is targeted to meet specific business and end-user needs.
- It is tied to the company's way of doing business.
- It uses actual cases or addresses actual problems familiar to the end users.
- It consists of ongoing training, with frequent fine-tuning to ensure that training continues to meet end-user needs.
- It uses managers and peers as trainers to promote ongoing application of new technology.

#### About the author

Steven Kerns is principal consultant with Input, a computer market research and planning firm based in Mountain View, Calif. He has 15 years' experience in the information industry.



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## IN DEPTH

# In search of one good micro project management package

The current generation of project management software for microcomputers may be heading toward that static stage in development that has plagued many other popular products. Companies that have recently introduced project planning software tools typically market them by improving or adding one or two features. Many companies use these features as selling points to grab a fistful of the market. But these improvements often just replace other features so that programs will fit available random-access memory.

The need for better project management methods in business is becoming critical. Software developers must survey end users to determine needs and then meet them.

With the current capital investment scarcity and high interest rates, formalized project management performed on personal computers can make the difference between success and failure for small to medium-size companies. For large corporations, there is virtually no end to the hidden inefficiencies that can be eliminated with a good project management tool.

Currently there is no such personal computer software, but some developers have come close, and a handful are listening carefully to the suggestions and criticisms of their users. Their response requires a commitment (difficult and risky though it may be) of more resources to the effort of developing a truly complete

## By Brian Pace

*For those not willing to wait for the arrival of a mature project management package, the best alternative may be to choose a second-generation package and modify the program in-house.*

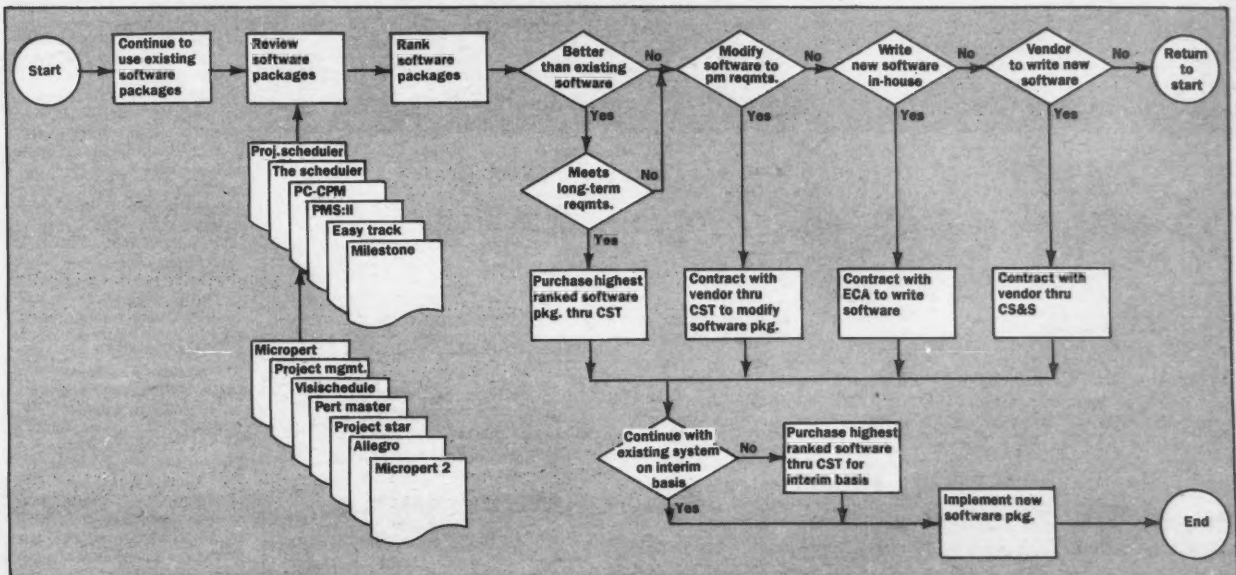
micro project management and planning package.

At Pacific Gas and Electric Co. (PG&E), a study of project management software has been in progress since early 1983. The goal of the study, which included evaluation of more than 30 software packages, was to locate the ultimate personal computer scheduling tool: one that met all the requirements of formalized project management. The perfect tool was never found. A "second generation" was defined, from which the best package was chosen by PG&E for immediate use. The search for the perfect third-generation package continues.

## Origins of project management

The advantages of computerized project management were first realized when it was developed by the U.S. Navy for the Polaris Missile Program. Programmers working with the massive memory in a mainframe dedicated essentially to managing the project designed a highly sophisticated set of software tools that facilitated an incredibly smooth-running operation. From this point, mainframe software companies began to develop and market project management software.

Mainframes, however, proved inefficient for managers on small projects. Because the systems typically were utilized too much, there were periods of downtime, log-on problems and slow turnaround as a result of other data processing priorities.





## IN DEPTH/MICRO PROJECT MANAGEMENT

*The microcomputer offered the project planner, for the first time, some of the utility and flexibility that his own mind afforded him, and at least the potential for future increases in computer memory and computational power.*

These are small inconveniences where very large processing tasks are concerned, but waiting for days to process small to medium-size projects can cause the entire project schedule to slip. Project planners are also required to spend large amounts of time at a remote project site, a circumstance that practically eliminates computer project management when only mainframes are available.

Minicomputers required

only minor modifications in existing project planning software. Although they had less memory, the reductions were not substantial enough to restrict most applications. The introduction of microcomputers with very small amounts of RAM, on the other hand, began a new era in software development in which economy was added to the objectives of creativity and thoroughness in programming. Project management, a memory-intensive

discipline (for humans and computers), suffered as a result.

#### More flexibility

In spite of this setback, however, the microcomputer offered the project planner, for the first time, some of the utility and flexibility that his own mind affords him, and at least the potential for future increases in computer memory and computational power.

That potential is now being realized. Indications are that eventually the term "micro" will apply only to the machine's physical size; desktop computers will have all the capabilities an individual user could possibly need, plus some. Eight-bit, 16-bit and now 32-bit microprocessors have been developed, and the technology has not approached its limits.

#### Evolution of software

The evolution of project planning software has roughly paralleled the evolution of microprocessors. Project management software for microcomputers is now in its second generation and seems rapidly headed toward real maturity.

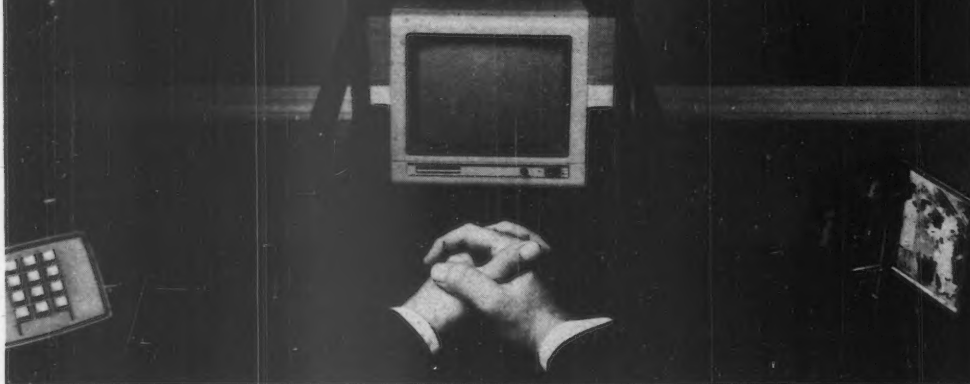
First-generation packages were primarily for home computers with up to 64K bytes of RAM. They met the needs of very small businesses and home enthusiasts. These packages included Milestone, marketed by Organic Software of Livermore, Calif., which was one of the first products on the market, and Visicorp's Visi Schedule. Visi Schedule came out shortly after Milestone and dominated the market for as much as a year, during which a number of similar products began appearing.

One of the more successful of these products, the Harvard Project Manager from Harvard Software, Inc., includes network plots (a very good feature), but fails to introduce other advanced features such as partial relationships.

These programs have good interactive designs, but they are best when working with a limited number of activities per project, covering short time spans and then only with simple finish-to-start activity relationships. They have a number of other limitations as well, including inadequate reporting functions, no provision for apportioning resources and only a single defined duration, usually days.

Managers who were thrilled with the tool at first no doubt became frustrated when the size and complexity of a project exceeded the capabilities of the software. For example, a manager needing to see the relationship between the third and 212th activities cannot see it on the screen, so he has to perform a series of repetitive

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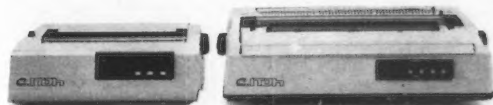
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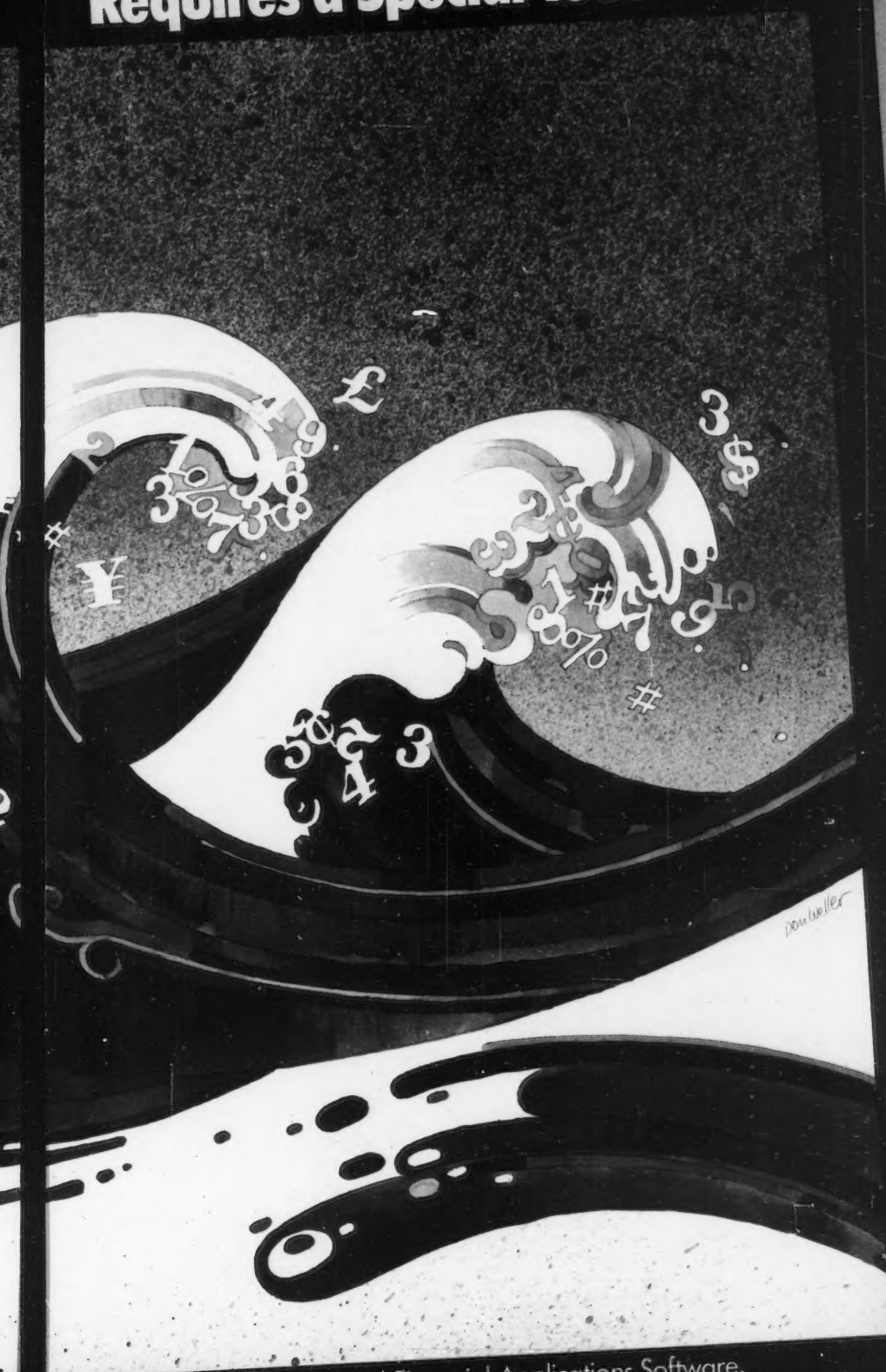
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## IN DEPTH/MICRO PROJECT MANAGEMENT

commands, stepping through the project plan between the two activities (assuming the program is capable of handling more than 200 activities). In essence, the tools do not mirror real-life project planning circumstances sufficiently.

Second-generation micro project management tools have made significant improvements in most of these areas, mirroring actual project development much more precisely. They typically re-

quire at least 128K bytes of RAM. The better programs use 256K bytes of RAM or greater and are designed to allow optional amounts of RAM for different numbers of activities.

Utilizing increased memory (good second-generation software handles at least 500 activities) defines activity relationships besides just finish-to-start, has improved graphics and report producing capabilities and a variety of other features that move

it into the realm of more legitimate business project planning.

The program PG&E chose above 30 other packages for its micro project management is Pertmaster, marketed by Westminster Software, Inc. in Palo Alto, Calif. Pertmaster features the capacity to handle up to 2,500 activities, the option of either activity-on-arrow or precedence network development, resource tracking capabilities and relative ease of use

for its degree of sophistication.

Other developers that have products with a number of good second-generation features but fall short of the mature product include Project Software & Development, Inc., Jelcomp Microcomputers Plus and Breakthrough Software Corp.

### Third generation

Third-generation packages will piece together the good aspects of existing sec-

ond-generation products and eliminate the inadequacies. These primarily have to do with speed, because programmers, concentrating on developing feature-packed products, spent less effort in that area. There are a number of specific features, though, which PG&E has designated as essential for effective micro project management.

First (but not necessarily most important) are ease of learning and ease of use. Since the nature of project management is so closely related to the nature of business itself and since it usually requires many years to become a very good project manager, software that reduces the learning curve through extensive use of command sequence menus (which could be bypassed once memorized for quick entrance and exit of the program) will increase the efficiency of new project managers significantly.

Because of the wide range of end users, the program should be simple enough for the beginner and powerful enough for the most sophisticated user. Many of the advanced end-user features developed recently — such as windows and drop-down menus — should be used to their full advantage.

Graphics capabilities should include a number of standard reports such as sorted and selected bar charts, network diagrams and various tabular reports. Because every organization has its own reporting structure, there should be provision for designing special report formats, including headers, footnotes and descriptive fields for all types of reports.

Good disk reports, readable by other popular spreadsheets, word processors and data bases should also be available. Full roll-up (hammock) capabilities (to summarize the duration of many activities and/or resources) within the project are essential to get summary schedules, as well as the ability to roll up several projects.

The number and relationships that can be entered should be no lower than 1,000 and preferably 2,000. Also, activities should be entered as closely as possible to the way text is entered on a word processor to take advantage of immediate and full editing capabilities. Dependency relationships between activities should include not just standard finish-to-start, but start-to-start and finish-to-finish with the capability to enter lag times as well.

Activity durations should allow the option of being designated as days, weeks or months. Changing durations from one designation to the next should be performed by

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**F**or instance, sophisticated automatic disconnect can be defeated by simple techniques, like call forwarding. And while hardware port protection devices add extra security — they also add additional salary overhead costs — while providing questionable protection.

**T**hen of course, there's conventional encryption. It's hard to keep secret when the keys are traveling through networks. It's costly. It's confusing.

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## IN DEPTH/MICRO PROJECT MANAGEMENT

a single command that will change all activity records as well as all screen and printed reports.

The ability to designate different types of resources, such as labor, materials and dollars, should be available. The rates and dollar amounts should be automatically recalculated according to their apportionment to activities. Resources should be leveled using available float and, if necessary, affect the critical path. Total resource amounts and fixed activities should be defined. Resource reports should give both project activity reports as well as line department totals for both the initial project and across many projects.

Achieving these goals appears to depend on two factors: programming in C and writing the software for one of the new generation of supermi-

crocs. The C language is currently considered the best programming language available for microcomputer business applications because it is very fast, very flexible and, most important, very transportable.

The 32-bit processors will be changing continually as they become more refined, and C, which has become very popular because of its programming attributes, will allow a program to be easily ported to other computers. The memory available in a supermicro will further simplify the programmer's job, at least partially removing the concern over economy and allowing more concentration on speed and adequate features.

#### Strategy for today

For those not willing to wait for the arrival of a mature micro project

management package, the best alternative may be to choose a second-generation package based on research to determine the best and most likely one to mature.

From this point, it may be necessary to modify the program in-house for an individual situation. For example, PG&E has hired a firm specializing in programming and consultation. It helps end users to develop interface programs for Pertmaster in order to load work breakdown structures with durations and dependencies into a word processing program (a clerical task) and bring the schedule plan bar chart out of Pertmaster into special PG&E forms in Supercalc III.

Second best, and possibly not much better, is the alternative of commissioning an independent software developer to create a project

management program according to your own specifications. This would incur great expense and might take a year or more, during which time a mature project management tool should appear on the market at a much lower price.

#### New era?

The possibilities for implementing an ideal project management tool suggest a new era in formal project communication. Roll-up capabilities through the use of work breakdown structures will eventually be used with an ideal project management package. These capabilities will make it possible to build a report-generating structure moving from the most specialized to the most general information.

For example, an engineer stationed at a remote project location will be able to send updated, detailed information to the project manager via modem, detailing the status of the lowest or most precise level of activities for which he is responsible. The manager, in turn, prepares reports on the level of detail for which he is responsible and for the levels above him in the organization. Upper management of the company then receives, possibly by microcomputer over a local-area network, the most accurate information possible, at a level that is appropriate for its needs.

Although methods of local-area networking offer possibilities for connection of microcomputers at corporate and other office locations, the danger is that microcomputers will begin to be viewed as fixed workstations. This viewpoint would essentially return computer project management to the mainframe era. But microcomputer networking is also taking great strides, and we may soon see very powerful portable computers temporarily tapping into local-area networks for reporting purposes.

#### Users' expectations

The microcomputer industry has done an excellent job in developing better products quickly. End users are well aware of it.

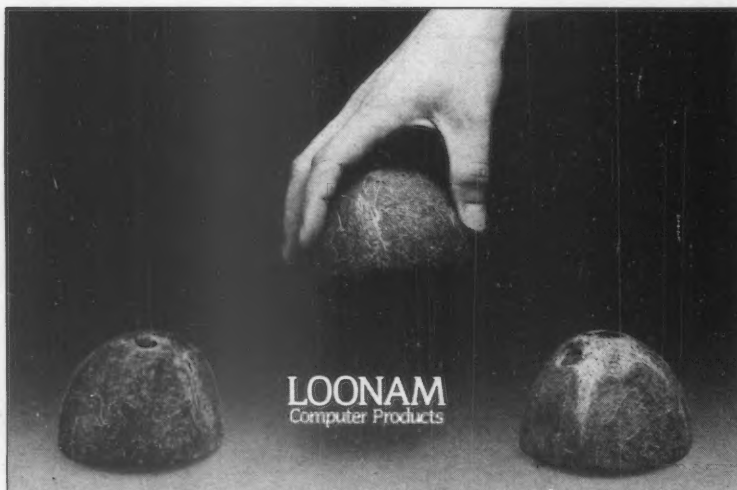
The level of expectation, especially in the Silicon Valley, is so high that customers find themselves surprised and a bit put out when quality products from emerging technologies are slow in coming. And if products do not perform as quickly and easily as expected once they arrive, users are proportionately less happy.

Project managers' levels of expectation are especially high, partly because of the immediate need for good microcomputer project planning tools and partly because the mood of the personal computer software market is breeding impatience for new and better products.

Although the task will be difficult, it is not beyond the level of technology or the capabilities of developers to produce the ideal micro project management software package in the next year.

#### About the author

Brian Pace is a project management analyst in the Project Management Services Department of Pacific Gas & Electric Co., a San Francisco-based, investor-owned utility company. Pace is currently responsible for researching the development of the personal computer as a project management tool.



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## IN DEPTH

# Information resources in user hands: when, where and how much

Many argue that users managing information resources almost never works. Admittedly, user control should be approached with caution — but approached, nevertheless, and cautiously implemented, not deterred.

By Stephen L. Priest  
and William A. Norko Jr.

In the late '50s and early '60s, hardware, software and systems staff resided in, and were managed by, user departments that had budgets large enough to acquire such resources. In the mid-'60s, a policy of strict adherence to centralization of these resources emerged.

First, larger systems offered economies of scale that could not be ignored. Computers and other information resources were so expensive that organizations mandated the co-location of all information systems and services.

Second, and equally important, executives realized that information resources were limited, and in determining priorities for computer services, they needed to consider the information needs of the whole organization. A centralized DP or MIS department would allow senior management to monitor total information needs effectively and also to control companywide use of information resources.

Until the late '70s, the central DP or MIS department was the sole information resource department. As well, DP or MIS almost always reported to the chief financial officer of the organization, historically the first end user and one requiring and maintaining strong control of their resources, computers included.

Today, positions in marketing, finance, human resources, health care administration, public administration and various other areas require the manager to have both education and experience with computer systems. Users have become more sophisticated and at ease with computers, and demand for computer services is enormous. Since the late '70s, as that demand for information resources has increased, technology has supplied new cost-effective solutions that work against the centralization of these resources.

The issue of how information resources should fit into an organization concerns two questions: Where should the information resources physically reside, and what are the lines of responsibility?

It is critical that senior management recognize that the path to a successful

information systems department lies along the road of cooperation and joint accountability. That department serves the total organization and to succeed must be a partner equal in importance to each of those with whom it must assume accountability.

In addition, the central information resource manager, the executive primarily responsible for creating the environment, must allow and foster this interaction. A central information resource department should report to the chief executive and not to another management level.

This view is also consistent with historical developments. While the advances in technology have in many cases eliminated large systems' economies of scale, of course there is, and will remain, a need for central resources. In addition, technological changes will not eliminate the need for senior management to monitor the total information needs of the organization and to control the companywide use of information systems and services to meet those needs.

The answer to the former question, where the resources should reside,



## IN DEPTH/WHEN, WHERE, HOW MUCH

## The information resource view

The management information systems (MIS) view held that the computer should not be limited to providing managers with an understanding of the current state of the organization, but should also be able to recall past experiences and use past and current data to try to project the future.

The information resource view expands on the MIS view. In addition to providing the three windows of information (past, present and future), computer systems and other technology, now as a group called information

resources, should make information immediately accessible to managers wherever they may be and whenever they may want to use it.

The central information resource manager must be as much at ease with the world of the users as in the specialized realm of technology. This executive faces the task of revising and replacing existing systems to reflect changes both in technology and also in company needs. The position must be filled by a person who has a firm understanding of the overall

organizational goals and who is firm in not subordinating them to departmental goals. The manager must also possess a genuine sensitivity to information resource users' needs, a balance of technical and managerial skills and a project orientation.

The user information resource manager is the user department's advocate regarding needs. This person maintains the current information systems and services and coordinates change through the central information resource manager.

follows a different line of logic. The user departments have their own information resource managers, who are responsible for coordinating the use of systems and services with the central manager, as well as for overseeing the use and maintenance of current resources.

The user departments should be educated in the use of these resources and be as involved as the central information resource department in developing them for their own use. Where should the resources reside? With the users.

Valid arguments against user control of the physical resources quickly surface. Many users are not educated about their responsibilities in this management role. Many do not have the technical staff or knowledge; others do not have the desire to assume these additional responsibilities.

Further, if they do assume this function, the monster of uncontrolled modification and change is loose. Once the resources (hardware, software and staff) reside with the user, how can changes to them be controlled?

*As a general principle, information resources should be managed as close to the users as possible.*

Of course, some information systems and services are multiuser by nature and should not be controlled by only one of the users, since that person or group is likely to take too narrow a view of how a system or service should be used (for example, data bases or information centers).

Indeed, many would argue that user management of information resources will almost never work and should always be approached with caution. Admittedly, it should always be approached with caution, but it should be cautiously implemented, not cautiously deterred.

Many well-meaning plans for allowing users more control of information resources have ended in disaster. But by and large, these problems concern implementation, not principle. As a general principle, information resources should be managed as close to the users as possible, and direction of that management task should be under the control of the central information systems department. We argue for central control and direction and also for the maximum individual user authority.

Sincere efforts should be made to enlist user departments. The idea of additional control over one's objectives is a strong motivating influence. Often users are quite willing to acquire additional education and gain some experience with information systems in order to manage their own information resources. When the effort to enlist fails, however, the central systems department has to play the more demanding role of planning, implementing and managing the ongoing use and maintenance of the information system. This situation should be the exception, not the rule.

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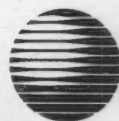
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## IN DEPTH/WHEN, WHERE, HOW MUCH

system output and planning for future system uses still falls to the user information resource manager. The user department must play a prominent role in the use of information resources, even if that role does not include bringing those resources physically into the department. Any potential user who does not recognize this need for interaction should be avoided.

#### Central control

What is the role of the central information resources department, then? Control. The central group establishes the framework in which these satellite areas will exist. The central department is responsible for identifying and promoting the global view of the organization's information needs. Once these needs are identified, the central department

*The steering committee should be composed of senior and line management representatives who have visibility at all levels of the company.*

must recognize changes and bring them to the attention of senior management.

An information resource department that sits as an equal partner with all the user areas has an equal opportunity to develop production, administrative and financial systems. It can serve the special operational needs of each area while providing a common data base for the reports needed by senior and middle management for overall control.

The organizational structure,

then, has computers and other information resources residing in the user areas whenever appropriate. In addition, the role of all information resource managers is to search out and develop these appropriate situations.

Furthermore, the central department has a dual role. It provides senior management with an organizational mechanism to monitor needs and control resource use. Second, it appropriately has many of the information resources physically co-located within its confines.

A steering committee is strongly advisable in any process that will result in selecting and implementing information resources. When competition exists for limited information resource budgets and staff, the committee will have the important task of determining project priorities. Furthermore, it will be responsible for requiring and encouraging the participatory interaction between end users and the central information resources department that is essential for the success of information systems projects.

The steering committee should be composed of senior and line management representatives who have visibility at all levels of the company. Since the information systems and services under consideration may have an impact on the achievement of organizational objectives, projects must be carefully defined and given priority relative to their impact on those goals.

A steering committee may have six to eight people, including, for example, the chief executive officer; the vice-presidents of finance, production and sales; and the central information resource manager. As a group, they should reflect the organization's personality and goals.

Depending on the organization's size, the chief executive may chair the committee; another senior executive may act as chairman if the chief executive focuses principally on external activities. Other organizations may appoint the chief financial officer or even the central information resource manager.

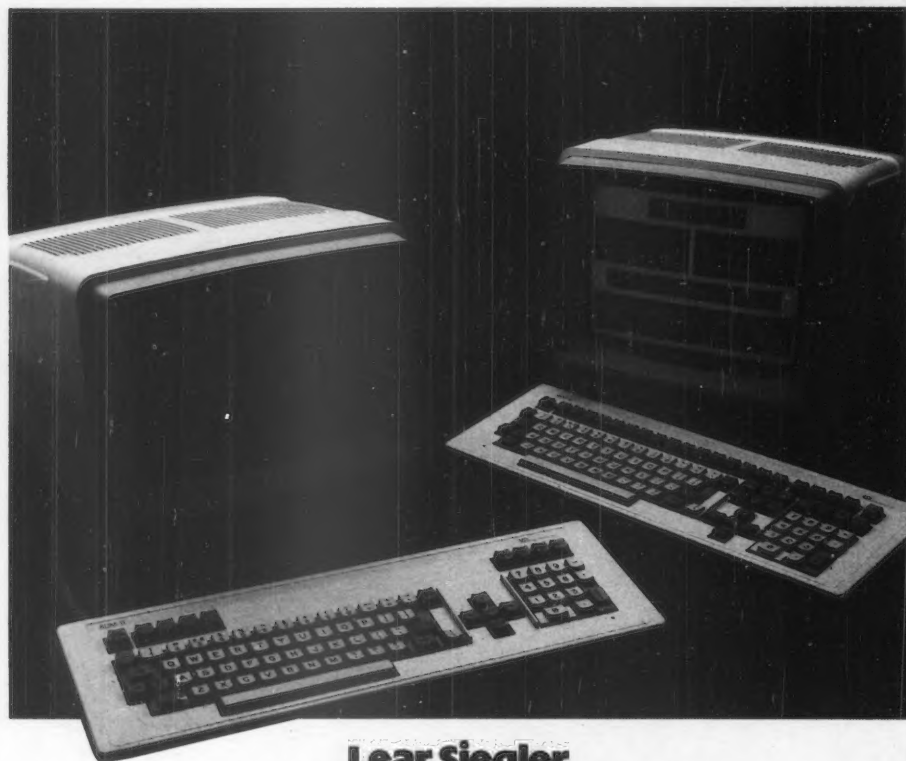
Having the information resource manager chair the committee may not be preferred, since this may give the impression that the committee is serving only the more narrow role of a sounding board for his department. Some organizations have the information resource manager take the minutes of the meetings. This allows him to be aware of the tone of the committee and to maintain a detailed understanding of its concerns.

Other department representatives may be called upon by the committee as deemed necessary and may or may not become permanent members. As a particular project gets into later stages, usually past the priority phase, the committee may decide that line managers and supervisors from the departments directly affected by the project should become ad hoc or advisory attendees of the committee meetings.

For example, a small town might establish a steering committee composed of the town administrator, town clerk, town accountant, the current information resource manager and two citizens with strong systems experience. If the committee is recommending the automation of town water and property billing, it might ask the town engineer and the assessor to become ad hoc attendees of committee meetings until those projects have been concluded.

#### The mission

The primary mission of the steering committee is to guide the use of information resources in the organization, including the central information resource department, staff, budgets and time. For companies with established information resource departments, this mission may mean maintaining a long-range information systems plan. The committee



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## IN DEPTH/WHEN, WHERE, HOW MUCH

may establish priorities and direction for the central information resource manager.

As users become more sophisticated, project requests usually increase. The central department cannot satisfy them all and, without the committee, will frequently be under pressure to begin or rush projects.

The evaluation of information staff requirements and the user's commitment to a project vs. the potential dollar savings and service is another committee responsibility. Projects considered by the committee for automation are given priority according to existing information department work loads and resources, as well as organizational goals.

This ranking of major information resource projects by the committee is an assumption of an important responsibility formerly associated with the central information resource manager. Committee representatives from the areas under consideration know about the proposed systems and services and can put into perspective their department goals vs. the company goals. The committee member who represents a department with a priority application acts as a liaison with the information resource function and takes responsibility for managing the appropriate commitment and interaction through the user information resource manager.

Organizations selecting company-wide information systems applications may have the committee participate in the vendor and software selection process. Some companies

*Steering committee members must be well-versed not only in their individual departmental objectives but in overall company goals. And considering the need for their expertise, members should not delegate their responsibilities to junior staff.*

may give the steering committee complete responsibility over the selection and control of all information systems applications, whereas others might use the committee as a sounding board or advisory body. In any case, the committee's mission and the role of each member should be made clear and agreed upon from the outset.

The members of the steering committee

must represent the best blend of experiential and academic knowledge available. They must be well-versed not only in their individual departmental objectives but in overall company goals. They must be experienced in managing their organization, and they must have a conceptual understanding of management principles and basic information systems theory.

Considering the need for their expertise, the committee members should not delegate their responsibilities to junior members of their staff. For the committee to serve its mission, it must have the commitment and personal involvement of each member. It is the responsibility of the chairman to see that the members maintain the committee's purpose and do not digress from their assigned roles.

#### Dodging problems

The steering committee should not be set up to manage the central information resource department, nor is it the channel through which that department's manager reports. He answers to the chief executive.

Further, the committee should not be involved in the details of the information resource department. For

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## IN DEPTH/WHEN, WHERE, HOW MUCH

*Using a steering committee to provide end-user interaction can produce a synergistic effect: greater commitment from both the users and the information resource department.*

instance, it should not determine whether additional memory is required or what model disk is best for a specific situation. The roles of the information resource manager and the committee must be clearly delineated.

Individual members may not always make the committee aware of the view of users they represent. This can hinder the selection and implementation process and ultimately result in project failure.

If people with limited decision-making responsibility are on the committee, they may not have the ability to respond appropriately for the areas they represent. Thus, user conflicts can occur after a decision or recommendation has been made.

Next, the self-interest of members may make it difficult for the committee to arrive at a consensus of what is best for the overall organization. Efforts to get the committee to make a decision

may be futile, or the final decision may reflect only the interests of the "strongest" member. This and other factors may cause an extended amount of time to pass without a decision or recommendation. The chief executive who feels a decision should have been made may not wait, preempting the responsibility of the committee.

Another pitfall: these committees sometimes waste time on concerns outside their scope.

These potential problems may dictate an approach where decisions concerning information resources are made solely by the chief executive and the central information resource manager. Prior to using the steering committee approach, any organization should recognize and address the pitfalls. It should be clear that selecting the right people for the committee is essential.

Finally, using the steering committee approach as a means of providing end-user interaction can produce a synergistic effect: greater commitment from both the users and the information resource department. This effect can be enhanced when users participate in all phases of strategic planning and systems development. It will result in removal of the systems mystique for users and promote an understanding and concern for success between both groups.

Cooperation between these two groups, involvement with each other's needs and problems and the acceptance of a policy of joint accountability for information resource project success or failure are attitudes and experiences that must be demanded and encouraged by senior management.

#### About the authors

Stephen Priest has been director of information resources at Brockton Hospital, Brockton, Mass., for the past 10 years. He is on the graduate faculty of Northeastern University and the undergraduate staff of Stonehill College in North Easton, Mass. He is currently working on a book about information resource management.

William Norko is assistant director, systems and data processing, at Eastern Utilities Associates, Boston. He is also a part-time faculty member of Stonehill College.



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# COMMUNICATIONS

## The office strategy that IBM built

By John Dix  
CW Staff

If IBM's proposed merger with Rolm Corp. goes through as planned, Big Blue will have added a critical missing piece to its office strategy: voice systems that also support data.

That strategy already includes, among other things, a building wiring scheme that provides voice and data outlets within every office of a corporation, cluster networks for IBM Personal Computers and a yet-to-be-officially announced premiseswide network to provide for the sharing of computer system resources.

Additionally, IBM holds a 60% interest in Satellite Business Systems (SBS), a communications carrier that offers private and public voice and data services.

### True-blue customer

If a true-blue customer bought — hook, line and sinker — the products and services of IBM, Rolm and SBS, after surviving a joint sales call with representatives from the three companies, the resultant system might look like the one depicted in the diagram.

In this scenario, the building has been wired from the ground up using the IBM Cabling System. The main components of this system are distribution panels found in the wiring closets of the building and a master wire distribution panel in the

basement next to Rolm's private branch exchange (PBX) and IBM's host CPU.

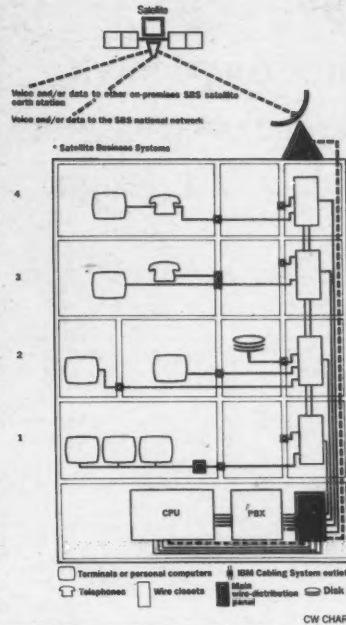
Twisted-pair wires — separate pairs for voice and data — are run from the patch panel on each floor to the outlets in each office of the building. The panels, in turn, are wired together and are individually cabled to the master distribution panel in the basement. The PBX and host computer are also wired to the master panel, as well as wired together. All voice and data connections, therefore, are handled by the Cabling System, but only in one example do voice and data signals actually share the same wire.

That case is depicted on the fourth or top floor. Here, an account manager has his asynchronous terminal plugged into the RS-232C interface in the back of his Rolm phone. He can be speaking on the phone while using his terminal and the protocol conversion capabilities of the PBX to access a 3270 application running on the IBM host.

### Wired directly to host

On the third floor, a programmer has his IBM 3278 display terminal wired directly into the host computer with the Cabling System instead of patched through the PBX. Each outlet is wired with separate voice and data wires.

If our programmer was demoted for See IBM page 96



■ Paradyne Corp. recently unveiled a slew of products, including a network controller, an X.25 gateway product for Systems Network Architecture and a 16K bit/sec modem/88

■ American Satellite Co. has announced that it has signed a contract with Sears Communications Co. for the development and installation of a private video teleconferencing satellite network/89

■ Federal Express Corp. recently named Harris Corp. and Tandem Computers, Inc. as contractors for a network to support its Zapmail service/89

■ Northern Telecom, Inc. has announced a series of products and enhancements for its SL-100 private branch exchange, including the ability to support switched 3270 traffic/94

### INSIDE

Controllers/94

## Not-so-bright future seen for bypass links

PARAMUS, N.J. — Bypass technologies will grab a surprisingly small share of the local loop market in the next six years, according to a study by the Perspective Telecommunications Group, located here.

The inability of long-distance carriers to offer coherent strategies, the limited local distribution capabilities of private network vendors and the confusion surrounding the impact of divestiture on users were cited as key reasons for the apparently slow growth of bypass in intracity communications networks (ICCN).

"When we initiated the study we expected alternatives to fare better as a result of technological improvements such as second-generation digital termination services, repackaged 18-GHz microwave and reduced-channel bank costs. However, in the final analysis, the realities of market-

See BYPASS page 97

## Stratus offers SDLC support

WASHINGTON, D.C. — Stratus Computer, Inc., the Marlboro, Mass.-based manufacturer of IBM-compatible fault-tolerant systems, has announced a Synchronous Data Link Control (SDLC) protocol that enables its Continuous Processing System to function as an IBM Systems Network Architecture (SNA) device.

The Stratus SDLC protocol software, Stratus SNA software and the Stratus SNA 3270 terminal emulation software were among several communications products that Stratus introduced at the recent Federal Computer Conference here.

Used to transmit data over communications lines in a SNA network, the Stratus SDLC protocol corresponds to the IBM SNA link layer, the vendor said. The SDLC protocol may be pur-

chased separately by users requiring only SDLC bit-synchronous protocol support and is priced at \$3,000.

Stratus SNA reportedly corresponds to the path control, transmission control and presentation service layers of the IBM SNA model. It also provides a Stratus system connection to SNA networks as a Type 2 physical unit and supports Type 2 (IBM 3278 terminals) and 3 (IBM 3289 printers), logical units, according to Stratus.

The price for Stratus is \$10,000. It will be available in the first quarter of 1985.

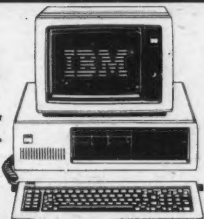
The Stratus SNA 3270 terminal-emulation package is said to emulate the IBM 3270 Information Display system, enabling any Stratus-supported terminal to appear to an IBM host as an IBM See SDLC page 97

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## COMMUNICATIONS

# Spartacus offers IBM link for non-IBM workstations

BEDFORD, Mass. — Spartacus Computers, Inc. has announced a system said to allow non-IBM workstations as well as the IBM Personal Computer and compatibles to communicate at transfer rates between 2.5M to 3M bit/sec with mainframe IBM CPUs running the VM/SP operating system.

The system includes the K-200 Ethernet Controller and Knet networking software, which runs as an application program under IBM CMS. Knet uses the Department of Defense's TCP/IP standard data transmission protocol and links an IBM host to any other system supporting that standard, the company said. These reportedly include workstations from Sun Microsystems, Inc., Apollo Computer, Inc. and Masscomp.

The company also announced Knet/PC, said to allow an IBM Personal Computer to participate as a host on an Ethernet local-area network using TCP/IP protocols.

In addition to Ethernet, Knet is said to support binary synchronous communication lines and channel-to-channel adapters. Networking software in the host IBM CPU may implement, in conjunction with the K-200, Xerox Corp.'s XNS, Digital Equipment Corp.'s Decnet, the International Standards Organization's Open Systems Interface or TCP/IP networking protocols.

Features of Knet include the ability to log on as a standard 3270 terminal without the need for an IBM control unit such as a 3274 or 3705, file transfer between IBM and non-IBM

systems using the Advanced Research Projects Agency Network file-transfer protocol and real-time dialogues between programs running in the mainframe and those running in a workstation, the company said.

The K-200 is also said to have on-line and off-line diagnostic facilities, which can present damaged packets and errors as they occur, allow the host to send packets to itself and present all packets on the Ethernet to the host, including those addressed elsewhere.

The company is shipping the K-200 Controller with Basic Knet now. The price for an IBM-to-IBM connection, including the K-200 and Knet/PC, is \$24,500, according to the company.

The Knet/PC operates on an IBM Personal Computer, Personal Computer XT or compatible micro with IBM DOS Version 2.0. The program requires 128K bytes of memory, one disk drive, a monochrome or color monitor with an 80-col display and 3Com Corp.'s Etherlink 3C500A controller board, the company said.

With Spartacus Knet networking software and a K-200 Ethernet Controller installed on an IBM VM system, a micro reportedly can be supported as a full screen IBM 3270 terminal. The micro user can then gain access to all VM facilities and application programs without an IBM control unit.

The price for the Knet/PC software is \$700.

More information is available from Spartacus, located at 5 Oak Park Drive, Bedford, Mass. 01730.

## Telecommunications networks growing in impact: DP managers

PARK RIDGE, Ill. — Most data processing professionals reported that local-area networks were not yet in use in their organizations, but they acknowledged that telecommunications networks will play a greater role in their futures, according to a survey by the Data Processing Management Association (DPMA).

The survey of DPMA members showed that 65% of the members' organizations do not now have local-area networks. But, it also showed that 93% of the respondents acknowledged the growing impact of telecommunications, according to the DPMA.

In addition, 47% of the members said they use some form of IBM's Systems Network Architecture.

DPMA conducted the survey in August, mailing eight-question survey forms to 1,000 members. There were 250 responses.

While most of the questions involved yes or no answers, the survey asked participants for their thoughts on the sort of involvement they needed from top management regarding telecommunications.

"The most common response was a very real need for a formal telecommunications policy," said Austin Weber, a DPMA spokesman.

Only 35% of those surveyed said their organizations had a telecommunications policy, although 79% of those who did have such a policy also employed a telecommunications manager or specialist.

### Reorganization needed

Weber said the DP managers urged top management to reorganize functionally and administratively to address data processing, office automation and telecommunications as an integrated corporate information system.

He said the respondents urged top management to take an active, long-range interest in telecommunications, rather than a wait-and-see attitude, and to view telecommunications as a corporate asset rather than a liability. He said issues the respondents wanted addressed included network standardization and purchasing products from compatible vendors.

On the question of deregulating the telecommunications industry, the respondents split evenly.

The survey results were published in the September issue of the DPMA newsletter "Compu-U-Fax," which is available from DPMA at 505 Busse Highway, Park Ridge, Ill. 60068.



## COMMUNICATIONS

## Banyan Systems introduces virtual networking server

WESTBORO, Mass. — Banyan Systems, Inc. has introduced Vines, a virtual networking server that can operate multiple mixed communication network cards such as Ethernet, Apple Computer, Inc. Applebus, asynchronous, bisynchronous and IBM Synchronous Data Link Control.

The heart of Vines is the Banyan Network Server, which features a Motorola, Inc. 68000 microprocessor; 512K bytes of random-access memory, expandable to 3M bytes; 43M to 160M bytes of hard disk storage; a 60M-byte tape drive; battery backup; and a six I/O expansion slot bus that accepts boards designed for the IBM Personal Computer, according to the vendor.

Vines uses an AT&T Unix System V operating system with improved file handling and intelligent communications support, Banyan Systems said. The software handles file service, printer service, communications and information retrieval.

The Banyan system consists of three elements: front end, back end and services. The front end reported-

ly allows the user to connect multiple types of local-area networks. The back end is said to provide protocol support for communications to host mainframes, larger systems and public data networks. A key support element is Streettalk, a distributed naming and directory system that allows users to locate and access services and devices independently of their locations on the network.

Prices for Vines range from \$16,900 to \$40,000.

Banyan Systems is headquartered at 135 Flanders Road, Westboro, Mass. 01581.

## Agridata goes worldwide

MILWAUKEE — Agridata Resources, Inc. (ARI), which operates the Agridata Network on-line videotext service for the agriculture industry, has announced plans to expand its agricultural information and communications services worldwide.

The Agridata Worldwide network will provide international and national farm news, financial information, weather services, cash and futures markets, commodity information, market analysis and recommendations, electronic mail and educational services, according to a spokesman. The network is now available in the U.S., Canada, Australia and New Zealand and will reportedly be running in the UK this month.

The procedure for securing international service to the worldwide network varies according to user locations, the vendor explained. The subscriber's microcomputer or data terminal makes a dial-up connection to either a domestic public data network or telecommunications carrier. The data networks or carriers are interconnected by international record carriers which connect users to Agridata Network/Uninet, ARI said.

To arrange for connection, users may contact the local postal, telephone and telegraph administrations. Costs are based on access time. Further details are available from ARI at 330 E. Kolbourn Ave., Milwaukee, Wis. 53202.

## Telecom service targets on-net capabilities

OAK BROOK, Ill. — Dama Telecommunications Corp. has announced a high-capacity telecommunications service emphasizing on-net capabilities for switched voice and data transmissions.

The Damacom service, designed for high-volume business applications, is based on the telecommunications system the company purchased from International Harvester Co. and is designed with Rockwell International Corp. digital common-carrier switches.

Damacom is said to feature centralized trouble reporting, telemanagement, call detail analysis, six-second incremental billing, optional customized directory assistance and optional customized reporting.

Network access is \$50/line/mo within 10 miles of a Damacom switching site, \$100/line/mo within 20 miles of a switching site and at standard telephone company access line rates in excess of 20 miles. Installation charges are \$175/line. Minimum usage is \$350/line/mo, with an initial minimum order of three access lines.

Services are priced according to three rate structures: Damacom-1, servicing Chicago, Memphis, New York, Philadelphia and San Diego, for 17 cents a minute days, 12 cents a minute evenings and 8 cents a minute nights and weekends; Damacom-2 (on-net), a banded Wats-type service originating in any of the Damacom-1 cities; and Damacom-3 (off-net), reaching all other serviced locations.

More information is available from Dama Telecommunications, which is located at 1300 Kensington Road, Oak Brook, Ill. 60521.

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## COMMUNICATIONS

## Paradyne communications products hit marketplace

Offerings include network controller, X.25 packet assembler/disassembler, modems

LARGO, Fla. — Paradyne Corp. has announced a series of communications products. This series includes a network controller, a Systems Network Architecture (SNA) X.25 packet assembler/disassembler, a 16K bit/sec modem and a series of diagnostic modems.

The DCX Network Supervisory Controller (DCX/NSC) reportedly was developed to consolidate the diagnostic and configuration capabilities of Paradyne DCX multiplexers into a single controller.

According to the vendor, the DCX/NSC provides functional control and monitoring of all data channels in a network and operates in a network with at least one DCX 850 multiplexer supporting up to 240 local channels and 15 network links.

The DCX/NSC reportedly consists of a controller, CRT, printer and RS-232 interface unit. According to the vendor, maps can be established at a central site and downloaded to a network node.

### IBM-compatible diskette

The controller is said to record network events on an IBM-compatible diskette. It is priced at \$18,000 and is available 60 days after receipt of order.

The PDN5220 is an X.25 multiport packet assembler/disassembler designed as a gateway between IBM SNA users and X.25 packet-switching networks, the vendor said. It offers transparent communication between remote SNA device clusters and SNA host processors, Paradyne said.

The packet assembler/disassembler reportedly performs automatic call setup, packetizing of SNA path information units, local polling of remote devices and flow control. It is said to support standard error recovery procedures for each protocol and detect and recover from modem failures.

It is available with two, four, six or eight ports with IBM SNA/Synchronous Data Link Control (SDLC), IBM 2780/3780, bisynchronous and asynchronous protocols, according to the vendor.

A typical four-port PDN5220 supporting three SNA/SDLC clusters costs \$6,500 and is available 60 days after receipt of order.

The Challenger 16.0 is a 16K bit/sec modem based on a single circuit card, allowing for high-density nest mounting. According to the vendor, it can be stored in groups of 12 modems in a 19 $\frac{1}{4}$ -in. nest to conserve data center floor space.

Also available as a stand-alone unit, the Challenger

16.0 has fallback speeds of 14.4K bit/sec, 12K bit/sec, 9.6K bit/sec, 8K bit/sec and 7.2K bit/sec. According to the vendor, it is capable of initialization in 253 msec and provides an 11-msec throughput delay.

The Challenger 16.0 is priced at \$8,300 and is avail-

able now, Paradyne said.

### Paradyne VHS/MPX

The Paradyne VHS/MPX series includes three modems with rates ranging from 14.4K bit/sec to 19.2K bit/sec with network management capabilities and integrated time division and statistical

multiplexers.

The modems are said to operate on standard voice-grade lines and to interface with a variety of teleprocessing facilities. They are based on multiple-processor architecture working with a very large-scale integrated signal processing chip set.

Pricing for the modems is \$10,200 for the VHS 14.4, \$11,520 for the VHS 16.8 and \$12,960 for the VHS 19.2. They will be available in early 1985.

For more information, Paradyne is located at 8550 Ulmerton Road, Largo, Fla. 33540.



## COMMUNICATIONS

## Sears gains network contract

ROCKVILLE, Md. — American Satellite Co. has signed a contract with Sears Communications Co. to establish a private voice, data and video teleconferencing network.

The network reportedly will connect the corporate and subsidiary offices of Sears Communications' parent company, Sears Roebuck

and Co., in 26 U.S. cities, making it the largest private satellite network for full-motion video teleconferencing, according to American Satellite.

Sears' Allstate Insurance Co. subsidiary will reportedly be the first teleconferencing user.

In addition, Sears will use American Satellite's National

Network facilities for intra-company voice and data communications and will resell telephone services to other business users.

Sears and its subsidiary companies are expected to begin using the national network immediately.

Allstate's video teleconferencing service is expected to begin by July 1985.

## Harris, Tandem to build satellite net for Zapmail

Federal Express Corp. has named Harris Corp. and Tandem Computers, Inc. as contractors for the first phase of a satellite-based data communications network designed to support Federal Express' Zapmail service.

The network is scheduled to replace a terrestrial sys-

tem servicing 16 cities in July 1985.

The satellite-based network will carry Zapmail, a mail service where documents are electronically delivered to distant Zapmail facsimile centers for hand delivery within two hours.

### Net equipment

The network will comprise Harris satellite group equipment, Tandem network interface products and Tandem Nonstop TXP computers. The computers, supplied under a separate contract, are already in operation.

Harris officials said they will supply earth stations utilizing Ku-band communications technology and its proprietary Delta Gain six-meter antennae.

Tandem's proprietary satellite communications interface equipment will reportedly link the earth stations to the Tandem computers.

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For more about the ESP 6310, the flexible terminal with the unlimited future, call Esprit (Es-free) toll free at 800-645-4508. In NY State 516-293-5600.

\*Registered trademarks: IBM, International Business Machines Corp. Viewpoint and Regent 25, Applied Digital Data Systems. The ADM3A, Lear Siegler, Inc. Televideo 925/910PLUS, Televideo Systems, Inc.



### SERIES/1 EDX SORT FAST/SMALL

A new SORT PACKAGE is now available to users of the IBM SERIES/1 COMPUTER SYSTEM using the EDX Operating System.

This new software product dubbed TMMSORTS, is designed for RAPID EXECUTION, CROSS-PARTITION LOADING, and only 8.5K MEMORY.

TMMSORTS is an easy to use disk sort which will handle up to eight input files.

TMMSORTS does not require the use of a log device.

TMMSORTS allows selective accessing of sorted input files.

TMMSORTS allows bypassing of leading records/sectors and bypassing of user defined null records.

TMMSORTS provides three different methods of end-of-input-file determination: seteed, physical, user.

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PEACE OF MIND TECHNOLOGY

## COMMUNICATIONS

## NCR Comten enhances software for Comten X.25 interface

SAINT PAUL, Minn. — NCR Comten, Inc. has announced software enhancements for its Comten X.25 interface.

Comten X.25 Release 4 is said to include a packet adapter, PA5DSP, which supports the IBM 3270 bisynchronous protocol and the TIA1, a terminal interface adapter supporting asynchronous terminals.

The new release also supports Comten Communications Networking System (CNS) in conjunction with packet-switching networks.

It reportedly provides host-side packet assembly/disassembly of the 3270 bisynchronous protocol, en-

abling terminal users to connect to packet-switched networks and access IBM Systems Network Architecture (SNA) and pre-SNA host applications.

The TIA1 interface adapter reportedly enables asynchronous terminal users in a packet-switched network to access hosts connected to a Comten 3600.

License fees, in addition to a base fee of \$300 per month or \$3,300 annually, and a \$48 monthly or \$528 annual fee, depend on the modules chosen.

Comten is located at 2700 Snelling Ave. N., Saint Paul, Minn. 55113.

## Digital Products introduces smart local net exchange

Said to connect from four to 48 computers

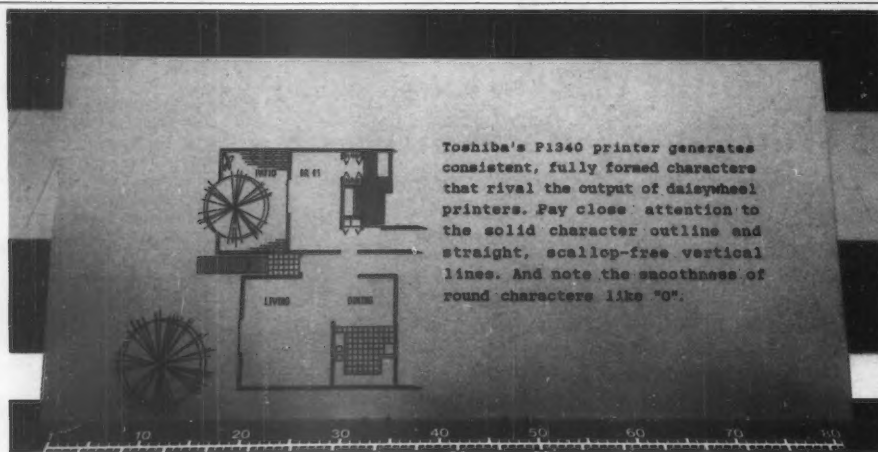
WATERTOWN, Mass. — A smart local-area network exchange that is said to connect from four to 48 asynchronous computers and peripherals was introduced by Digital Products, Inc.

The Digital Netcommander is a 16-port turnkey unit that is said to provide port contention management, terminal switching, printer sharing and message store and forward. The unit can be linked for expansion and can be a server in a larger local-area network.

According to the company, port names are user defined, routing is said to be automatic and contention paths can be permanently established without the need for special access codes.

The product is priced from \$1,095 to \$2,950, depending on configuration.

More information on the Digital Netcommander is available from Digital Products, which is located at 600 Pleasant St., Watertown, Mass. 02172.



Toshiba's P1340 printer generates consistent, fully formed characters that rival the output of daisywheel printers. Pay close attention to the solid character outline and straight, scallop-free vertical lines. And note the smoothness of round characters like "O".

## Now you can make a great impression for under a grand. The Toshiba P1340 3-in-One printer.

Toshiba has been a pioneer in printer technology and development. Where we have led, others can only follow. Our P1340 printer is an impressive example—the first 3-in-One printer for less than \$1,000 that provides high-speed, letter-quality copy, high-resolution graphics and an advanced 24-pin dot matrix print head. And at only \$995, the Toshiba P1340 is priced well within your reach.

**Perfect Impressions.** Our unique high-density 24-pin dot matrix print head gives you sharp, clean results from any of the P1340's three resident typefaces. With its 8-mil print wire and overlapping dot pattern, you get letter-quality daisy wheel sharpness and definition—at dot matrix speed.

**Impressive speed.** You won't have to give up speed for letter-quality results. Because the Toshiba P1340 gives you the best of both. At 54 cps, you get letter-quality copy at better than twice normal letter-quality speed. And even faster draft copy at 144 cps.



**An impressive eye for detail.** The Toshiba P1340 doesn't just give you high speed, letter-quality type. At 180 x 180 dots per square inch, it also gives you high-resolution graphics that lead the industry.

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And since it features Qume SPRINT 5™ emulation and choice of parallel or serial interface, the Toshiba P1340 3-in-One™ printer can work with an impressive number of word processing programs. And almost every micro-computer, including IBM PC® and Macintosh™.

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SPRINT 5 is a trademark of Qume Corp. IBM PC is a trademark of International Business Machines. Macintosh is a trademark of Apple Computer Inc.

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## FCC launches investigation into APS network rates

WASHINGTON, D.C. — "Market projections are not an acceptable basis for determining the rates for a new service," the Federal Communications Commission said last month in launching a nine-month investigation of Accunet Packet Service (APS), AT&T's controversial packet-switched network offering.

The commission has allowed AT&T to begin offering APS because the tariff is not "unlawful on its face," but the implementing order directs AT&T to explain how it can charge only 82 cents for an Accunet kilopacket when it previously charged \$1.35 for a Basic Packet-Switching Service (BPSS) kilopacket.

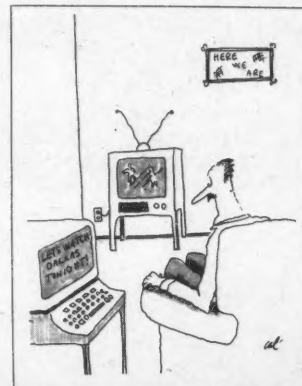
AT&T's original explanation was that anticipated market growth would allow this reduction.

### Pay less, receive more

The FCC pointed out that Accunet customers not only pay much less, but also receive much more service than BPSS customers.

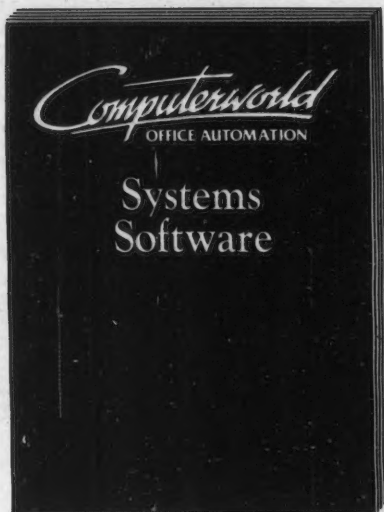
The latter offering consisted only of packet switching, while the former includes transmission, plus switching.

Competing vendors, which charge roughly twice what Accunet does, maintain AT&T's rates are that low because they are being cross-subsidized.





# If you miss the next issue of CW Office Automation, look at the issue you'll miss



## December

Coverage includes: the user interface, natural languages, data bases, decision support systems, information centers, and artificial intelligence. Also, we'll highlight user solutions and vendor directions as we consider the current and future benefits of systems software.

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after another."



## COMMUNICATIONS

# Northern Telecom unveils PBX products, enhancements

NASHVILLE — Northern Telecom, Inc. has announced a series of products and enhancements that include compatibility with IBM data communications protocols for its SL-100 digital private branch exchange (PBX).

Designed to eliminate the need for coaxial cable, one feature allows switched access to IBM 3274 and 3276 controllers from IBM 3270 terminals over twisted-pair wiring. It reportedly lets the terminals access multiple host computers and data bases. The feature has a suggested list price of \$745 per terminal and \$855 per controller port, the vendor said.

The Asynchronous/Synchronous Interface Module (Asim) is said to

permit asynchronous and synchronous terminals such as the IBM Personal Computer, IBM Displaywriter and Xerox Corp. 560 to communicate with various data bases through the SL-100.

Asim is intended for SL-100 customers who want to operate their data terminals alternately in the synchronous and asynchronous modes.

A stand-alone module, the Asim provides a single RS-232 interface for synchronous and asynchronous terminals, thereby eliminating the need for modems in local-area networks, the company said.

The price for the Asim, to be available in December, is \$456, the company said.

The vendor also announced an IBM 3270 protocol conversion unit that permits most Ascii asynchronous terminals to operate as IBM 3178- or 3278-type on-line terminals. A single unit attached to the SL-100 connects up to seven asynchronous terminals to various hosts. It is priced at \$8,400 for a seven-terminal unit.

The SL-100 System 36 Gateway is a protocol converter said to allow Ascii asynchronous terminals to be IBM System/34-, 36- and 38-compatible. The terminals reportedly communicate through the SL-100 network with IBM System Network Architecture /Synchronous Data Link Control protocol capabilities.

The SL-100 PC Interface Card was designed to let the IBM Personal Computer and Personal Computer XT communicate in digital format with the SL-100 via twisted-pair wiring. Designed to plug into the personal computer, it has a wire that plugs into a standard telephone jack for connection to the SL-100 and access to local and remote terminals, other computers and data bases. The card costs \$195.

The Asynchronous Interface Line Card is said to allow connection of the PC Interface Card and other asynchronous RS-422-compatible devices to the SL-100 system. It costs \$200.

The X.25 Gateway unit connects to the SL-100, reportedly enabling Ascii terminals to communicate through the SL-100 with public or private packet data networks. A unit allowing up to 16 simultaneous connections costs \$375 per connection, according to the vendor.

The Computer-to-PBX Interface (CPI) is a feature that can be incorporated in the SL-100 system to allow data communications over telephone wiring or other transmission media using the T-carrier 1.54M bit/sec transmission-rate standard, according to the vendor.

It costs \$5,000.

The CPI will be available in the second quarter of 1985 and the other products in the third quarter of 1985.

More information is available from Northern Telecom located at 259 Cumberland Bend, Nashville, Tenn. 37228.

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## CONTROLLERS

### ICOT CORP. Model 440

Icot Corp. has announced a communications interface designed to allow up to 16 asynchronous devices to access X.25 packet-switched networks or host computers.

The Icot 440 Asynchronous X.25 Pad is said to feature an X.25 network/host interface that operates at speeds up to 56K bit/sec. Dual X.25 links are available as an option, according to the vendor.

Password security is provided for configuration control, incoming calls and closed user groups, according to the vendor. Network control commands reportedly can be executed from any terminal port or from a network control center via the X.25 link.

The Icot 440 is based on an Intel Corp. 8088 microprocessor using direct memory access methods to improve throughput and features auto-connect, permanent virtual circuit capabilities and user-defined function keys, according to Icot.

It is said to conform to all CCITT X.3, X.21, X.25, X.28 and X.29 standards and to be certified for use with the GTE Telenet Communications Corp. network.

The product is available in four-, eight-, 12- and 16-port versions and is priced at \$2,695, \$3,445, \$4,195 and \$4,945, respectively. A second X.25 link port costs \$500, according to Icot.

Icot, 830 Maude Ave., Mountain View, Calif. 94039.

See UNITS page 96



# If you don't remember everything you did last night— you need EPILOG.

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## COMMUNICATIONS

**IBM** from page 85

writing some terrible code and moved into the smaller office next door, the building operations personnel could plug his terminal into the outlet in the new office and swap the patch cord on the distribution panel to correspond with that office, leaving his logical address the same.

On the third floor, a number of group supervisors have 3270 Personal Computers wired together using the everything-but-announced token-ring local network to share a hard disk. Each supervisor has plugged his computer into his respective data outlet, which is connected to a wiring concentrator (not shown) in the wire closet. The wiring concentrator, in effect, connects the devices in series (assembles them in a ring by joining their hands) and is itself connected to the patch panel.

When devices want to communicate they ask for a token, append their data to it and pass it off to the device holding, for example, its left hand. That device examines the address of the token and if it is not its own, passes it on to the next device and so on. Ultimately, the token will be routed through the patch panel either to the host in the basement or to other floors, depending on the number of devices that the user wants to support on a single ring. According to IBM, 200 is a good maximum.

On the first floor of our customer's building, strategic planners have interconnected their Personal Computers using the recently announced PC Net. Each one of these mid-split broadband nets can support up to 72 Personal Computers. In this example, the customer is using a yet-to-be developed gateway (that black box) to interconnect the network with the mainframe using the Cabling System.

Last, but certainly not least, our customer has had it with private-line order delays and AT&T divestiture and jumped at the chance to have SBS install a private satellite antenna on the roof.

Using this, he can send both voice and high-speed data directly to the rooftop of his similarly equipped branch office in Cleveland.

Improbable? Yes, but a possible scenario of how the pieces IBM is assembling may fit together.

**UNITS** from page 94**TIMPLEX, INC.**  
**Enhanced Microplexer MX.25 PAD**

Timeplex, Inc. has announced an X.25 packet assembler/disassembler (PAD) designed to provide flexibility, convenience and security in packet-switched nets.

The Enhanced Microplexer MX.25 PAD is said to offer two options to manual-

ly entering the network address, which can be up to 15 digits. Mnemonic calling reportedly allows a terminal operator to reach a specific computer by typing in a single word, while autoconnect allows dedicated terminals to reach the same ports repeatedly by establishing a virtual circuit connection.

An MX.25 PAD with four ports starts at \$2,500.

Timeplex, 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675.

**INFOTRON SYSTEMS CORP.****Infolinx.25**

Infotron Systems Corp. has announced an X.25 packet assembler/disassembler to provide Ascii terminals with access to packet-switched data networks.

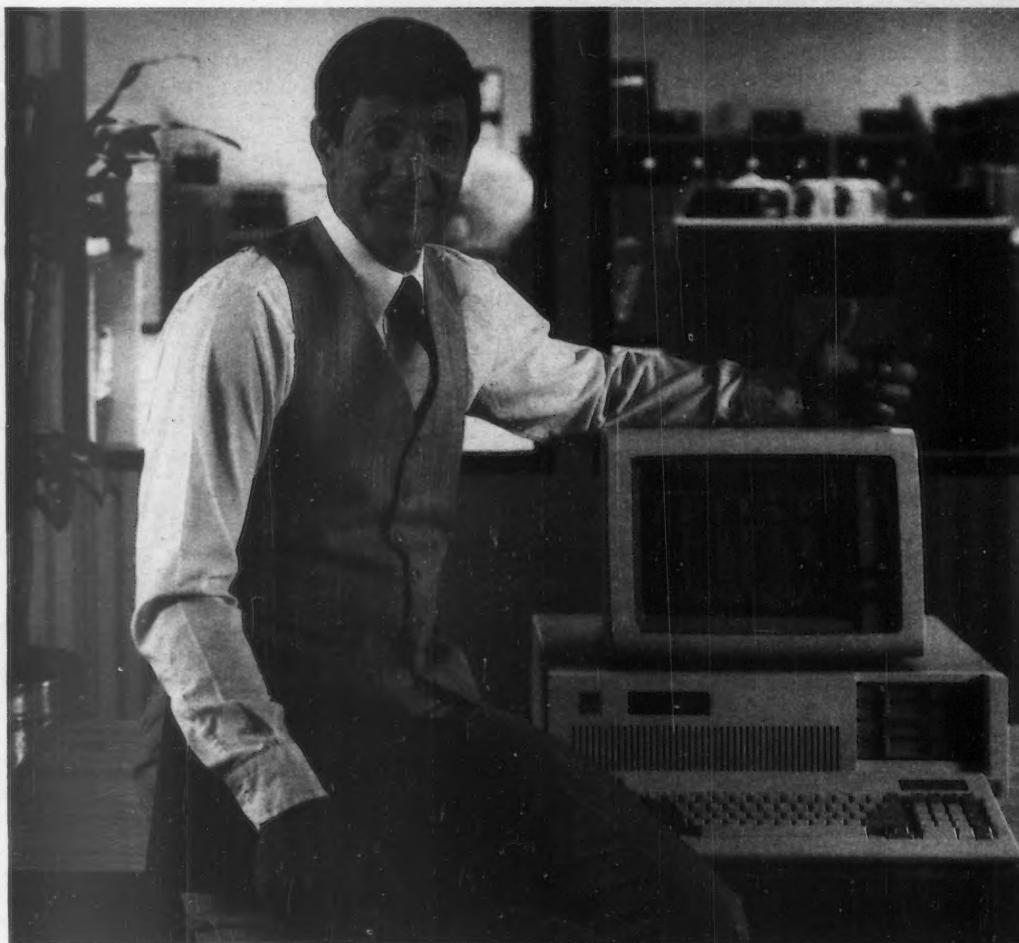
According to the company, the Infolinx.25 connects up to 16 asynchronous devices with one or two X.25 networks or host computers. It includes two 56K bit/sec

links, and can be configured to meet a variety of network requirements, the company said. Users can specify a number of channels, channel speeds, packet sizes and independent port speeds.

The X.25 network link is said to operate on a standard RS-232C interface or on a long-distance, high-speed RS-422 interface. Prices start at \$2,700 for four channels.

Infotron Systems, Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

## "I RELY ON AST FOR





## COMMUNICATIONS

**SDLC** from page 85

3278 device. This software package will be available in the first quarter of 1985 and will be priced at \$1,500.

**Three communications packages**

Stratus also introduced three communications packages aimed at the financial and retail markets, where its fault-tolerant computer systems are targeted. Stratus announced it can support the Swift protocol for international electronic funds transfer, a Poll/Select protocol used in automated teller machines manufactured by Burroughs Corp. and NCR Corp. and the Visa protocol for the connec-

tion of Stratus systems to the general-purpose Visa electronic funds transfer network.

In addition, Stratus introduced a Model C200 communications controller, priced at \$7,500, which reportedly accommodates all Stratus line adapters and allows the user to select a mix of line adapters. It also unveiled a C109 Smartsync line adapter required to run SNA, X.25 and other high-level communications. It is priced at \$1,000. A C110 Smartsync line adapter that was also introduced is said to be used to connect a variety of asynchronous devices such as those used in shop floor control. It is priced at \$1,000.

Stratus Computer is located at 55 Fairbanks Blvd., Marlboro, Mass. 01752.

**BYPASS** from page 85

place confusion and fragmented vendor response proved to be the major obstacles," observed Brad O'Brien, Perspective Telecommunications' vice-president of research.

Bypass will account for 3.5 million circuits, 5.9% of the 57.9 million nonresidential circuits in 1990, according to the study. In terms of revenue, the bypass market by then will amount to \$1 billion out of a total of \$27.9 billion.

O'Brien added that local telephone companies have demonstrated a high degree of responsiveness to bypass by moving to cost-based services and by augmenting existing facilities with digital technology such as subscriber loop carrier and fiber subscriber loop carrier. He said that by 1990 those technologies should stabilize the local telephone companies' positions. "There is no technology on the horizon which can compete with properly priced [telephone company] services," he added.

The study, conducted during the summer of 1984, involved on-site and telephone interviews with 80 users, 43 vendor representatives and eight state and federal regulatory agency officials. It was designed as a follow-up to a similar 1983 study.

The study found that the telephone companies' pricing in the intracity market and new technologies offered by new competitors are driving some customers away from the former Bell system companies. It said that those companies will lose market share throughout the 1980s, with the lost business peaking at about 5%.

But by the late 1980s, the local telephone companies' technologies, particularly fiber-optic technology, will be at a point where the companies will be competitive for essentially all intracity applications, according to the study.

**Other findings included:**

■ By 1990, excess local transmission capacity will be available in most major metropolitan areas.

■ Network management and control equipment on the customer premises will be the long-term ICCN opportunity.

■ Alternative ICCNs will never address 100% of an establishment's external communications requirements.

■ Organizations usually implement alternative ICCNs as part of a larger system, not primarily for reasons of bypass.

The study, "Intracity Communications Network-II" is available for \$6,500 from Perspective Telecommunications Group, 15 Prospect St., Paramus, N.J. 07652.

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Using PCs in the field sales offices gives us the flexibility of local PC processing power, and the benefit of concurrent processing, since we can use DOS functions while continuing to maintain the mainframe link. It's certainly a major money-saver—a really smart alternative to dumb terminals.

We expect those new sales offices to grow rapidly. When they do I'll be adding AST cluster functions so we can use PCs and VT100™ or compatible terminals in our configuration. All of them can communicate to headquarters over a shared phone line to reduce our telecommunications costs.

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AST was the first company to offer micro-to-mainframe products for the PC, and they continue to lead the pack with a full spectrum of communications products, including AST-3780™ RJE support. Customer support and product reliability. That's why AST is my single source.

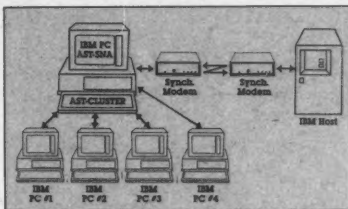
Frankly, you should find out more about them. Give their Customer Information Center a call at (714) 863-1333 Ext. 5249 and get acquainted. Just tell them you were referred by another satisfied MIS director.

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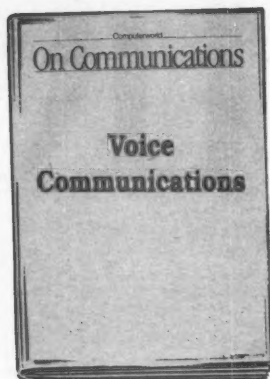
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**November**

Who uses digitized-voice store-and-forward systems? What's the latest on combining voice and data? Telephony has branched out into many sophisticated systems. We'll look at how voice communication is being integrated into the whole communications system.

Closes October 5



**December**

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# SYSTEMS & PERIPHERALS

## Mainframe use to explode?

By John Desmond  
CW Staff

MOUNTAIN VIEW, Calif. — If one IBM 3084 mainframe is capable of handling all the arithmetic needed to process payroll for every worker in the U.S., why are so many mainframes out there?

Because so much mainframe capacity is expended running operating systems, software and data base management systems, according to a recently released report on large-scale systems directions from the computer software and services market research firm Input, Inc., based here.

While the report, titled *Large-scale Systems Directions: Mid-year Update — 1984*, questions the trend in some instances, the authors conclude the trend toward large host systems characteristic of IBM's Systems Network Architecture (SNA) is "highly appropriate." Further conclusions were that large-scale systems will be needed through the 1980s to manage large data bases and provide support for decision-making programs and that data base applications will tend to become distributed because of price/performance advantages offered by smaller CPUs.

Highlights of the report include findings that:

■ Demand for large mainframes is increasing exponentially. The report cites the expected announcement of IBM's Siera series mainframes in late 1984 and predicts a follow-up announcement of the Summit series in 1988. "The quest for Mips

[millions of instructions per second] seems unending," the report states, adding that IBM's strategy is to preserve the dominant role of large mainframes in its SNA.

IBM software, including the MVS/XA operating system and the DB2 data base management systems, will fuel demand for large mainframes because of the overhead required by the software. Further, IBM's distributed processing strategy is expected to involve linking intelligent workstations to central processors, which will "generate enormous demands for mainframe Mips," the report predicts.

■ Many functions once assigned to software could be more economically assigned to hardware, especially microcomputers. Large mainframes should be used primarily to maintain large data bases and to provide processing power for calculations that cannot be practically performed on minicomputers or micros.

■ Large overhead of IBM operating systems is becoming "an accepted fact

of life," but should not be. Users should be more aggressive about achieving more efficient use of processing power through software. "Operating systems have taken on a life of their own," the report states.

■ As IBM moves to protection and security of operating systems, users will be further removed from understanding their system software and less able to improve software performance. "IBM's current trend toward withholding source code is certainly not designed to facilitate under-

See STUDY page 113

*The trend toward large host systems characteristic of IBM's SNA is 'highly appropriate.'* — Input, Inc. report

## Memorex fixes 3680 disk drive production ills

By John Desmond  
CW Staff

SANTA CLARA, Calif. — Nine days after technical problems halted production of Memorex Corp.'s IBM 3380-compatible disk drive, the 3680, the company said defective parts, which reportedly caused head crashes on some users' drives, have been replaced.

A spokesman for Memorex, Geri Flinn, said production of the 3680 was stopped from Sept. 17-20, and shipping resumed on Sept. 27. He said the problems with the Memorex 3680 were related to the coating on the disk platters used in the drive. Flinn said, "Disk components that were out of specification are now being replaced with components that are in specification."

The disk platters are manufactured by Disk Media, Inc. of Westlake Village, Calif., a joint venture of Control Data Corp. and Memorex's parent company, Burroughs Corp. While Memorex announced it would resume production of its 3380-compatible disk drive, CDC announced on Sept. 27 that it was getting out of the IBM-compatible peripheral market. A company spokesman said CDC's 33800 disk drive will be discontinued.

The CDC 33800 series also used disks manufactured by Disk Media.

A spokesman for CDC said the company's decision to discontinue the 33800 and get out of the plug-compatible market was "not occasioned by the current technical problems with the 33800."

■ IBM has announced it is now producing volume quantities of its 256K-bit memory chips/104

■ Data General Corp. unveiled a workstation which conforms to government Tempest requirements/104

■ A maker of integrated circuit design systems has unveiled a turnkey product that uses a compiler-like software package/105

### INSIDE

Turnkey Systems/105

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### HARD TALK/TOM HENKEL

## CPU ratings lack an accepted benchmark

With CPU life cycles shortening and users' demands for computer resources increasing, the issues of processor performance and capacity planning are clearly growing in importance for many DP executives.

Measuring CPU performance is a difficult, time-consuming and often expensive task. And doing the job accurately has been called everything from an exact science to a black art.

Most performance experts are quick to point out that there are no quick answers when it comes to measuring how well a processor performs. Measurements such as millions of instructions per second (Mips) are often helpful in referring to certain classes of CPUs, but they are rarely useful when it comes down to actual measurement. The reason is, there is no rule governing what Mips actually means, and vendors' methods for calculating Mips often vary.

The performance question must be addressed on two levels: First, how does the user shovel through mounds of vendor hyperbole to determine how a given computer system performs relative to its competition; and second, how does the user formulate a method for determining corporate capacity requirements in the face of more and more diverse uses of a computer system?

There are many consulting companies around to aid users in developing internal capacity planning programs. Furthermore, many compa-

nies have grown to realize the importance of capacity planning and are willing to devote the time and resources to do a good, accurate job.

Deciding which processor to buy is another question. It can be extremely expensive, not to mention time-consuming, to perform a consistent benchmark test on a series of processors. Many users simply rely on the vendor's performance claims, while others attempt to develop their own benchmarks to rate a system's performance.

A standardized method for evaluating processor performance simply does not exist. Standards organizations, such as ANSI and ISO do not appear to want to touch the issue — mainly because it is virtually impossible to establish a consensus on the right way to evaluate performance.

Over the years, a number of benchmarks have been developed which have been used to evaluate various aspects of computing. The problem with these benchmarks is that the vendors of products that rate well on a given benchmark tend to praise it, and the vendors who do not fare well tend to condemn it.

One of the most often quoted benchmarks, at least in the scientific processing community, is Whetstones. Developed in the mid-1960s by a team of English researchers, Whetstones consist of a series of Fortran programs aimed at providing a consistent means for measuring scientific

See CPU page 113

## Stride supermicros out, aimed at OEM market

RENO, Nev. — In its first major product announcement since changing its name, Stride Micro recently unveiled three supermicrocomputers, the Stride 420, 440 and 460.

Aimed principally at OEMs and sophisticated end users, the Stride 400 series is software-compatible with the Sage line of microcomputers manufactured under the company's old name of Sage Computer Technology. The company changed its name when it discovered several other companies in the computer marketplace were also using the name Sage as product monikers, according to William R. Delaney, vice-president of marketing.

The entry-level Stride 420 was designed primarily as a stand-alone system, but it can also be used in a networking environment using a built-in Corvus Systems, Inc. Omninet local-area net, the vendor said.

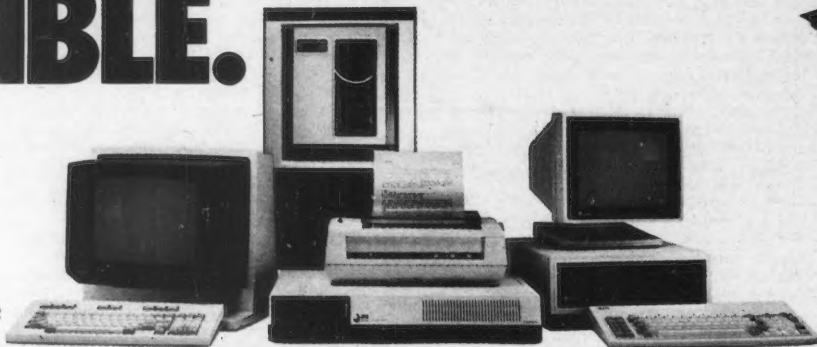
Standard features of the 420 include a 10 MHz 68000 microprocessor, the VMEbus, 256K bytes of random-access memory (RAM), a 640K-byte 5¼-in. floppy disk drive, four RS-232C serial ports, the Omninet local-area network, Softech Microsystems, Inc.'s Liaison networking software, a Centronics Data Computer Corp. parallel port, 4K bytes of CMOS RAM with battery backup and Softech's P-system operating system.

A number of other operating systems are also supported including Digital Research, Inc.'s CP/M-68K, Whitesmiths, Ltd.'s Idris, Ryan-McFarland Corp.'s RM-COS and AT&T's Unix.

Options include a 12 MHz microprocessor, a 512K-byte RAM expansion, a second 640K-byte floppy disk

See STRIDE page 112

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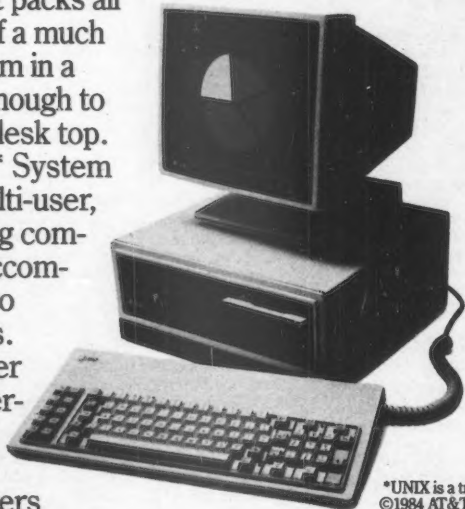
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SYSTEM V

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## SYSTEMS &amp; PERIPHERALS

## IBM producing 256K-bit chips for large cache memory units

ESSEX JUNCTION, Vt. — IBM has announced it is now producing volume quantities of 256K-bit memory chips at its semiconductor manufacturing and development facility here.

The chip is used in large cache memory units that temporarily store data being transferred from disk storage to a computer's main memory, such as IBM's recently announced 3880 Models 21 and 23 storage control units, which offer either 8M, 16M or 32M bytes of cache memory, the company said.

The 256K-bit chips are mounted on ceramic substrates 1-in. square, with eight chips on each substrate. The

substrate is enclosed in a metal cover, then attached to a 4-million-char. circuit card for insertion into the storage control unit, which can hold up to eight cards.

IBM said the cost of storing a bit of information has been reduced by a factor of 1,000 over the past 20 years. IBM announced in September 1981 it had fabricated an experimental 288K-bit chip, and earlier this year the company announced it had fabricated experimental 1G-bit chips.

More information is available from IBM, General Technology Division, which is located at Essex Junction, Vt. 05452.

## DG launches workstation Dasher D460T meets Tempest standards

WESTBORO, Mass. — Data General Corp. has announced the Dasher D460T workstation with a 12-in. monochrome monitor, detached low-profile keyboard, full-duplex asynchronous communications protocol and an Ascii-standard serial printer port.

The unit is said to meet Tempest requirements. Tempest is an unclassified government term for a series of secret requirements to protect electronic devices from certain forms of radio frequency interference.

Features of the D460T include user-definable screen windows, an extended read-only memory charac-

ter set, a set of editing commands and character graphics facilities, the vendor said.

Other screen features reportedly include a directly viewable field of 24 lines by 81 char. or 24 lines by 135 char. Bidirectional vertical scrolling and 162-char. horizontal scrolling are available.

The D460T is on the federal government's Preferred Products List, the company said.

The terminal supports Ansi X3.41 and X3.64 command formats, DG command codes, RS-232C and RS-422 interfaces and local printing, including graphics. The D460T also supports DG's AOS, AOS/VS, Rdos and the Micro Products Operating System.

The company's Comprehensive Electronic Office software is said to use the editing and screen management features of the D460T workstation.

Prices for the workstation start at \$4,000, the company said.

More information is available from DG, which is located at 4400 Computer Drive, Westboro, Mass. 01580.



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## HP announces two dot matrix printer models

PALO ALTO, Calif. — Hewlett-Packard Co. has announced two dot matrix printers — the HP 2565A, with a printing speed of up to 600 line/min, and the HP 2566A, with a printing speed of up to 900 line/min.

Each printer may have up to 14 fonts installed at one time, and both can print bar codes, HP said. The standard character set in both printers is 8-bit Roman, which supports Ascii, in addition to 11 European languages at standard 10 char./in., compressed 16.7 char./in. and double-high/double-wide characters, the company said. OCR-A and OCR-B character sets are available as options. The printers can link to HP 3000 and HP 1000 computer systems through the HP-IB interface.

The single-unit price for the 2566A is \$21,766; the 2565A is \$18,766.

HP is located at 1820 Embarcadero Road, Palo Alto, Calif. 94303.



Fly-by-night computer outfit.

## SYSTEMS &amp; PERIPHERALS

# Silicon compilation said to speed VLSI circuit design

LOS GATOS, Calif. — Silicon Compilers, Inc. has announced what it claims is the first very large-scale integration (VLSI) design system to use a language compiler-like software tool called silicon compilation.

The system, Genesil, reportedly allows systems engineers to design application-specific VLSI chips geared specifically to their products, according to Stanley Mazor, Silicon Compilers' manager of applications engineering.

Genesil retails for \$545,000 and includes a Digital Equipment Corp. VAX-11/750 superminicomputer that runs AT&T's Unix operating system. It can support up to four users and comes with 4M bytes of main memory, a 450M-byte disk storage system, four-color terminals and system software.

## Said to speed design process

Most integrated circuit designers still work in much the same way programmers did before language compilers were introduced, Mazor said, separating an integrated circuit design into thousands of separate transistors before reconnecting them individually in what is often a slow and error-prone process. The silicon compilation software reportedly speeds up this procedure, reducing chip design costs and slicing the design process from years to five or six months.

Using silicon compilation, users fill out a menu-driven form that lets them construct

a block diagram of a chip. They receive feedback on interconnection size and speed, which becomes more precise as the level of design detail increases.

According to Mazor, the finished design is punched onto a tape that the manufacturer feeds into a pattern-generating wafer machine, producing a prototype, or

mask, of the final chip. Designers can work on four or five chip designs at once, he said, and significant design decisions can be made during the exploratory design phase; decisions that, with contemporary design methods, would have had to wait for actual silicon manufacture.

Three commercially suc-

cessful chips have already been designed with Genesil software, according to a Silicon Compilers spokesman: an Ethernet controller from Seeq Technology, Inc., a key circuit in DEC's Microvax minicomputer and a smart chip for monitoring high-resolution graphics displays in a Sun Microsystems, Inc. engineering workstation.

According to figures released by Dataquest, Inc., a market research firm in Cupertino, Calif., the worldwide market for application-specific integrated circuits is expected to explode, increasing from \$5 million in 1984 to almost \$15 million by 1989.

Silicon Compilers is located at 105 Albright Way, Los Gatos, Calif. 95030.

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## TURNKEY SYSTEMS

### VISUAL SYSTEMS CORP. Viscoscan

Visual Systems Corp. has announced the Viscoscan system for computer-assisted microfilm retrieval. The unit is compatible with Datapoint Corp.'s Attached Resource Computer local-area network and uses Datapoint's Associative Index Method retrieval package for disk access.

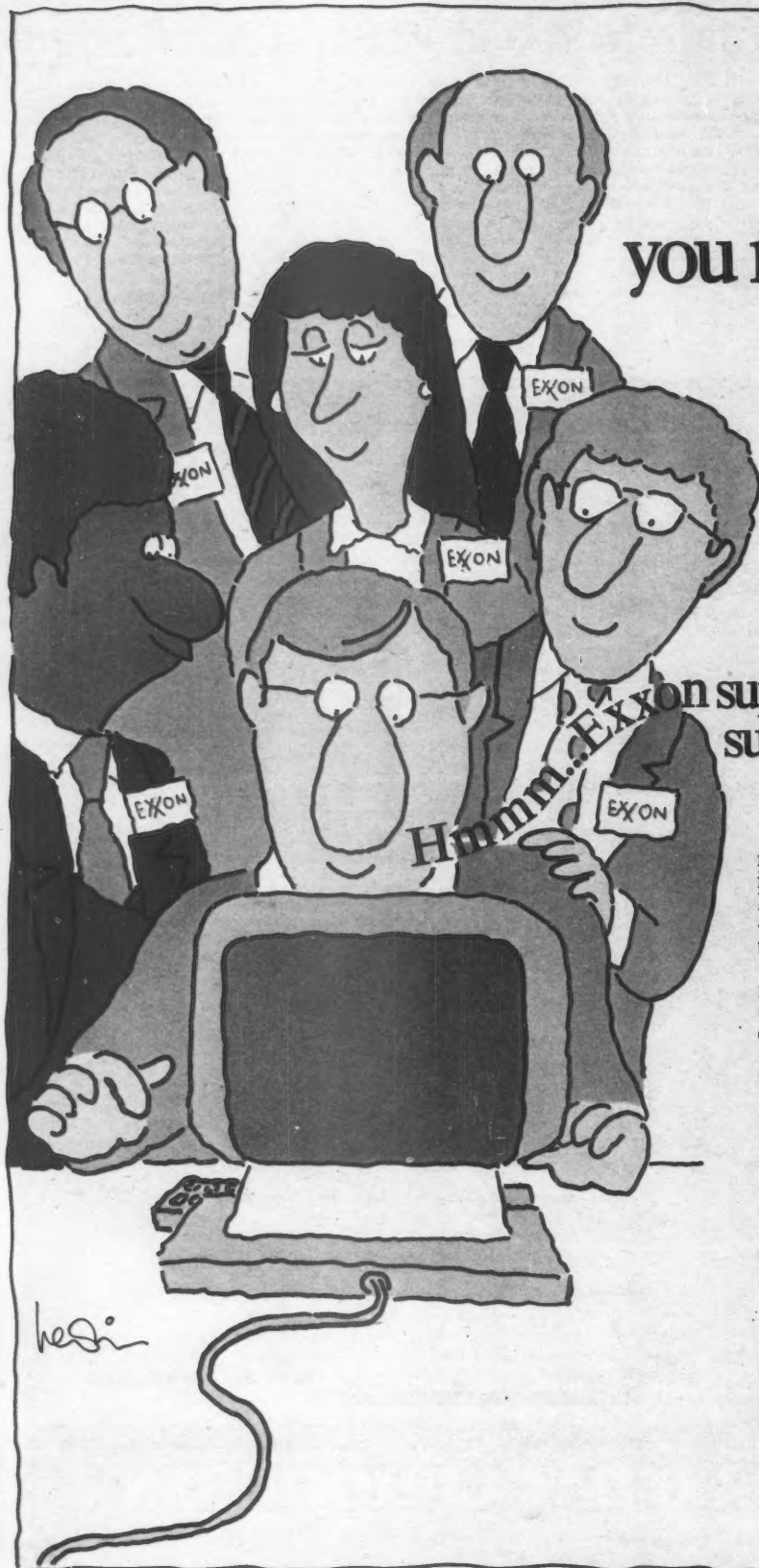
Viscoscan uses a microfilm camera with a computer interface and laser bar code scanner to generate a retrieval system index with no manual keyboarding, the vendor said. Datapoint systems running on the RMS operating system, with a 128K-byte minimum main memory and four ports, are needed to support the system.

The price of the Viscoscan software module is \$29,560, and the price of the microfilm camera is \$9,800.

Visual Systems, Suite 3210, 3000 Town Center, Southfield, Mich. 48075.

See TURNKEY page 107





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## SYSTEMS &amp; PERIPHERALS

**TURNKEY** from page 105**NELSON ANALYTICAL, INC.**  
4416X

Nelson Analytical, Inc. has introduced a multichromatograph system built around a Hewlett-Packard Co. HP 9000 desktop computer.

The 4416X features the vendor's Chromware software, which is designed specifically for chromatography applications. Chromware is said to provide the chromatographer with special calculating routines that permit multilevel curve calibration, multireference and internal-standard quantitation and separate methods for dual-channel applications.

Other features reportedly include user-programmable sampling rates up to 100 point/sec, method-controllable acquisition and baseline parameters, in sequence autocorrelation of standards and complete raw-data and results-data storage.

The HP 9000 computer utilizes 3¼-in. floppy disks for either 540K bytes or 1.2M bytes of storage. HP's Thinkjet, an inkjet dot matrix printer/plotter, is included for hard-copy output of chromatograms and reports.

The 4416X is compatible with optional Winchester hard disk drives of 5-, 10- or 15M-byte capacities and can support multiple printer/plotters, the vendor said. Price is \$12,000.

Nelson Analytical, 10061 Bubb Road, Cupertino, Calif. 95014.

**COMPUSCAN, INC.**  
Laser 3 Formsreader

Compuscan, Inc. has announced the Laser 3 Formsreader optical character recognition (OCR) data entry system, said to read electronically documents and forms containing images or data that is typed, machine-printed or hand-printed.

The system reportedly stores the data on magnetic tape for entry into DP systems, eliminating manual key-boarding.

The system consists of a Laser 3 OCR scanner with a vacuum feed transport; editing terminals for corrections, verifications and display of captured video images; and special editing and formatting software. Up to 4,400 single-line documents can be read per hour, the company said.

The basic price for the Laser 3 Formsreader is \$72,500.

Compuscan, Building 2, 81 Two Bridges Road, Fairfield, N.J. 07006.

**PROCESSORS****GENRAD, INC.**  
2295 Central Station

Genrad, Inc. has announced the 2295 Central Station, said to support Genrad's Semiconductor Component Analysis Network (Scan) software and to link the company's 173X test systems series.

The 2295 reportedly provides monitoring of incoming test processes, off-line program generation, automatic collection of test data and automatic data reporting. It is based on the Digital Equipment Corp. PDP-11/23 with 250K bytes of random-access memory and system software including RSX-11M Version 4.0 with editors and utilities, Genrad said.

The standard 2295 system includes a 65M-byte Winchester disk,

an 8-in. floppy disk, a 160 char./sec serial printer, a DEC VT100 terminal and connector cables. A Scan software license is included in the system's price.

Scheduled for November shipment, the 2295 system, with Scan software, is priced at \$24,900.

Genrad, 107 Tracer Lane, Waltham, Mass. 02254.

**SKY COMPUTERS, INC.**  
Sky Warrior

Sky Computers, Inc. has announced the Sky Warrior array processor, which reportedly is able to perform 15 million floating-point operations per second. It is packaged for integration into microprocessor-based systems.

The Sky Warrior reportedly performs arithmetic operations in com-

pliance with IEEE P754 standards for 32-bit and 64-bit data. It is said to offer direct memory access of up to 16M bytes at a transfer rate of up to 20M byte/sec.

The processor is said to perform a 1,024-point complex Fast Fourier Transform in 3.9 msec. Its arithmetic unit consists of very-large scale integration floating-point devices and bit-slice devices. The Warrior contains an internal 16K-byte, 32-bit cache memory.

The Sky Warrior, initially available on the VME bus, costs \$14,900.

Sky Computers, Foot of John Street, Lowell, Mass. 01852.

**TELEMATICS INTERNATIONAL, INC.**

## Series 1H

Telematics International, Inc. has

announced the Series 1H general purpose programmable communications engine, an entry-level version of the company's Series 1 used in the X.25 packet-switching network and Digital Equipment Corp.'s VAX-11 front-end processor products.

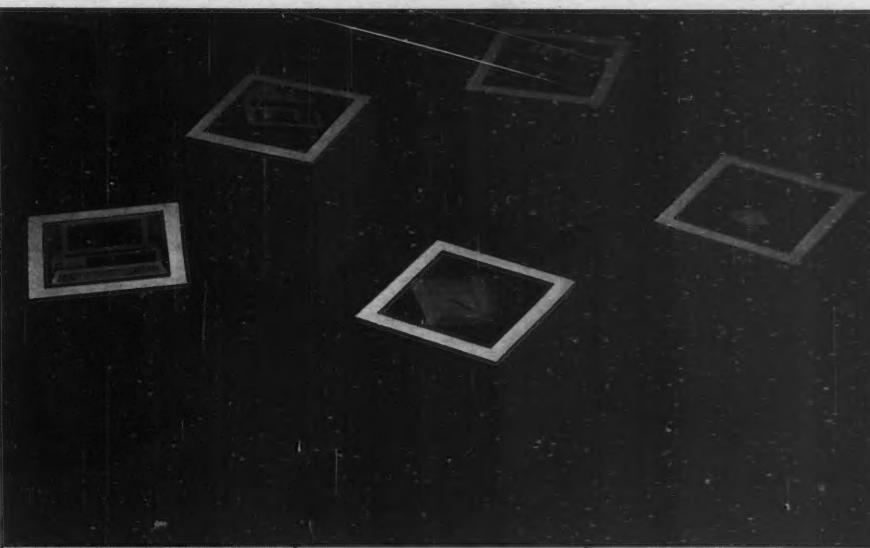
The Series 1H supports Pascal, C and a Motorola, Inc. 68000 microprocessor-based assembler. The 1H is intended to provide data communications system designers with the software tools and hardware capabilities to implement communications systems.

Communications capabilities supported include asynchronous, binary synchronous and IBM's High-Level Data Link Control Adapter and Synchronous Data Link Control, the company said.

The Series 1H provides 1M byte of

Continued on page 110

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## SYSTEMS &amp; PERIPHERALS

Continued from page 107

solid-state memory, a 5M-byte removable cartridge disk, a Small Computer Standard Interface I/O interface and a communications processor with channel expansion for up to 64 full-duplex lines with a throughput of 100K byte/sec, the vendor said.

Prices for the Series 1H engine range from \$10,000 to \$35,000, depending on the configuration.

Telematics, Crown Center, 1415 N.W. 62nd St., Fort Lauderdale, Fla. 33309.

## TERMINALS

TERM-TRONICS, INC.  
Miracle

Term-Tronics, Inc. has announced

the IBM 3178-compatible Miracle display terminal, based on Mos Technology, Inc.'s 6502 microprocessor.

The terminal screen offers a 9 by 14 dot matrix, an 80-col by 24-row screen format and an 8K-byte memory, the vendor said. The interface is IBM's RG62A with IBM's 3270 protocol and an 87-key keyboard.

Miracle is priced at \$995. Term-Tronics, 7408 Trade St., San Diego, Calif. 92121.

GTE COMMUNICATION  
SYSTEMS CORP.  
XT300E Actionstation

GTE Communication Systems Corp. has announced the XT300E workstation, with a communication speed that is said to be four times greater than earlier models of the unit.

According to the vendor, the XT300E integrates the functions of a telephone, a speaker phone and a CRT display terminal with editing ability, full-duplex modem, speed dialing and automatic sign-on capability to remote CPUs.

It reportedly can stand alone or be interfaced via RS-232C ports and features an AT&T 212A-compatible modem and transmission speeds of 300 bit/sec and 1,200 bit/sec.

The product has a split-screen feature, up to 16 programmable function keys and a screen editor that allows message composition of up to 22 lines, the vendor said.

The price of the 1,200 bit/sec model is \$1,795, and the price for the 300 bit/sec model is \$1,395, according to the vendor.

GTE, 2500 W. Utopia Road, Phoenix, Ariz. 85027.

NORTHERN TELECOM, INC.  
Displayphone Plus

Northern Telecom, Inc. has announced the Displayphone Plus, a combined voice and data terminal said to emulate Digital Equipment Corp. VT100 and VT52 terminals. The product also reportedly features IBM 3101 cursor addressing and Ansi 3.64 cursor addressing.

The Displayphone Plus contains an internal AT&T 212A-compatible autoanswer modem with selectable 300 bit/sec or 1,200 bit/sec transmission rates, according to Northern Telecom.

The product also features a retractable keyboard and amber screen.

Displayphone Plus costs \$1,595. Northern Telecom, 259 Cumberland Bend, Nashville, Tenn. 37228.

LASER GRAPHICS, INC.  
Rascol compatible with Tektronix, Inc. 4695

Laser Graphics, Inc. has announced that its Rascol color-raster image maker is now compatible with Tektronix, Inc.'s 4695 ink-jet printer.

When interfaced to Rascol, the 4695 is said to produce color hard copy at a maximum speed of five min/page and a resolution of 120 dot/in. The Rascol image maker, using a Motorola, Inc. 68000 microprocessor, converts graphics objects from host personal computer software into dot matrix commands to drive color printers at maximum speed and resolution, Laser said.

The Rascol is compatible with the Diablo Systems, Inc. C-150 and the Xerox Corp. 1770 color ink-jet printers, according to Laser Graphics. The Rascol is also said to be compatible with the IBM Personal Computer and can run Lotus Development Corp.'s 1-2-3. The Rascol interfaces to the printer via a parallel Centronics Data Computer Corp.-compatible printer port or an RS-232C serial port.

The prices for Rascol begin at \$1,995, the company said.

Laser Graphics, 17671 Cowan Ave., Irvine, Calif. 92714.

## PDSFAST: PERFORMANCE

PDSFAST is a super high-speed PDS Management tool developed by Software Engineering of America. Using PDSFAST, hundreds of installations large and small (including 8 of the Fortune 10), are saving 75 to 90 percent of their Elapsed Time, CPU Time and I/O Time in the following areas:

**IEBCOPY Usage** PDSFAST is a JCL-transparent replacement for Iebcopy doing Compression, Copying and Unloading of PDS datasets to Tape or Disk at 5 to 80 times the speed of Iebcopy.

**SPFCOPY** Provides ultra high speed compression under SPF 3.1 WITHOUT REQUIRING AUTHORIZATION.

**SMP Processing** Speeds up ALL LEVELS of SMP processing by 25 to 90 percent.

**DASD Space Reclamation** PDSFAST can increase DASD space reclamation by 40 to 60 percent by automatically compressing all individual PDS's on a volume at super high speed before defrag and compaction procedures.

**DASD Management** PDSFAST interfaces with ALL EXISTING DASD MANAGEMENT PACKAGES reducing elapsed times by 75 to 90 percent.

PDSFAST benchmarks taken from user evaluations:

	Elapsed Time	CPU Time	EXCP's	Job Cost
<b>52 cyl. PDS Compress</b>				
Iebcopy	67 min. 18 sec.	12 min. 27 sec.	103,486	\$131.05
PDSFAST	3 min. 23 sec.	8 sec.	712	\$4.22
<b>12 cyl. PDS Copy</b>				
Iebcopy	9 min. 14 sec.	1 min. 20 sec.	10,792	\$18.47
PDSFAST	48 sec.	.7 sec.	122	\$1.75
<b>47 cyl. PDS Unload to Tape</b>				
Iebcopy	58 min.	14 min. 52 sec.	97,253	\$92.05
PDSFAST	4 min. 3 sec.	37 sec.	911	\$5.74
<b>3380 TSO Volume Compress 2,679 individual PDS's</b>				
PDSFAST Driver	11 min. 7 sec.	31 sec.	8,299	\$29.87

The PDSFAST driver interfaces with all DASD management and DEFRAK packages.

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For further information about PDSFAST please call SEA at (212) 206-7660, located at 150 Fifth Avenue, New York, NY 10011.

SOFTWARE ENGINEERING OF AMERICA

SEA

## PRINTERS/PLOTTERS

FERIX CORP.  
Model 800 Magnetic Page Printer

Ferix Corp. has announced a non-impact office printer based on a thin-film magnetic recording head, operating at 10 page/min and intended for printing from 2,000 to 10,000 page/mo.

The Model 800 Magnetic Page Printer is said to generate 57,600 dot/sq in. on a magnetically coated drum, which comes in contact with a dry toner as it rotates. The toner adheres to the magnetic images, which are transferred to ordinary paper and heat-fused to produce characters, the company said.

The price of the printer to OEMs ranges from \$2,000 to \$3,000, depending on options and quantities.

Ferix, 48571 Milmont Drive, Fremont, Calif. 94538.

DIGITAL ASSOCIATES CORP.  
L-900 band printer

Digital Associates Corp. has announced the L-900 band printer system.

Continued on page 112



## THE ITT 9236. IT HAS THE FUNCTIONS YOU WANT TODAY, THE FLEXIBILITY YOU'LL NEED TOMORROW.

When it comes to extended functions, our new 9236 display has everything.

For instance, it gives you dual logical units that let you change applications with a single keystroke.

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free, high-resolution, 14-inch screen that tilts and swivels.

On top of all this, our 9236 gives you extended data stream and programmed symbols for color graphics. Plus a long list of exclusive ITT productivity features, like automated keystrokes, built-in notepad, dynamic color assignment, and auto log off/power off.

But perhaps the most important thing we've built into our 9236 is a flexible, open architecture. The kind of architecture that'll take you into net-

working, the electronic office, or wherever else you want to grow.

Of course it wasn't easy designing in all this and keeping the 9236's price competitive, too.

But, then again, giving you more display for your money has always been what ITT Courier is all about.

For more information, contact your nearest ITT Courier Representative. Or call the ITT Courier Sales Support Dept. at 1-800-528-1400, toll-free.

**ITT**  
COURIER



## SYSTEMS &amp; PERIPHERALS

Continued from page 110

tem, said to provide 33% more throughput than 600 line/min band printers and featuring linear free-flight hammers said to eliminate character clipping.

The L-800 features a cartridge ribbon and use of large-scale and very large-scale integration technology for enhanced reliability, the company said. It is available with an optional 55-db cabinet, said to provide an office noise level less than that of a typewriter.

Printer controllers and interfaces are said to provide compatibility with a range of minicomputers and mainframes. The Remote Line Printer System is offered for remote locations with an RS-232 interface and is compatible with IBM 2780 and 3780 communications protocols.

The L-800 printer alone is priced at \$7,100; interface controllers add up to \$2,400 to the price.

*Digital Associates, 1039 E. Main St., Stamford, Conn. 06902.*

## STRIDE from page 101

drive, a floating-point processor and a memory management unit. The systems are priced from \$2,900, the vendor said.

### For medium-size businesses

The Stride 440 can support up to 16 users or peripheral devices and was designed for the small to medium-size business. It features the same basic configuration as the 420, but incorporates a 10M-byte Winchester disk drive and offers 10 RS-232 ports.

Options include a 12-MHz Motorola, Inc. 68000 microprocessor, RAM expansion to 2M bytes, hard disk upgrades ranging up to 33M-byte units, multiuser expansion to 16 ports, a floating-point processor, a memory management unit, a streaming tape backup unit and a second 640K-byte floppy disk drive. The units are priced from \$5,900.

The top-of-the-line Stride 460 is available with hard disk storage that is upgradable to 448M bytes. The unit, which uses a standing desk-side processing unit, has the same basic features as the 440. It includes a 15M-byte hard disk drive and a VME-bus expansion card cage.

Options include a 12 MHz microprocessor, RAM expansion to 3M bytes, multiuser expansion to 22 serial ports, varying configurations of Winchester disk storage, a floating-point processor, a memory management unit and an on-board cartridge tape backup unit, according to the vendor. It is priced from \$8,900.

Stride Micro is located at 4905 Energy Way, Reno, Nev. 89502.

## GRAPHICS SYSTEMS

### TELESIS SYSTEMS CORP. Graphics software and hardware

Telesis Systems Corp. has announced a combination of hardware and software that is said to improve the speed and flexibility of its Engineering Design Automation workstations.

The features reportedly

provide two to six times greater speed, a high-resolution monitor, expanded pixel memory, filled-line graphics and color priority, the vendor said.

The 2K-by 2K-byte memory plane option for the Telesis Graphics Processor software option allows the product's roam and zoom functions to be performed without delay or flicker, the vendor said. The 1,000-by 900-pixel, 50Hz noninterlaced color monitor is said to

provide flicker-free images.

The Graphics Processor allows penplot artwork to be done at actual etch width with filled solid lines, the vendor said.

A T-300 turnkey system with the above enhancements, high-resolution monitor, Digital Equipment Corp. J-11 microprocessor and special-purpose graphics processor is priced at \$78,500.

*Telesis Systems, 21 Alpha Road, Chelmsford, Mass. 01824.*



# Memorex announces Freedom of Choice in the 3270 world.



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## SYSTEMS &amp; PERIPHERALS

**CPU** from page 101

processor performance. The problem with Whetstones is, as one researcher put it, it has become "folklore software." The original set of Fortran programs has been modified over the years so that there are many different versions of the benchmark.

Two other more recent

benchmarks are available either free or for a nominal charge. They are:

■ **Lispac**, from the Argonne National Laboratory in Argonne, Ill. Lispac is a Fortran benchmark designed to evaluate scientific processors performing floating-point operations. A random matrix of linear equations, the benchmark can be run on a wide range of computer

systems ranging from microcomputers to large supercomputers. It is reportedly not machine-specific and can operate on virtually any Fortran compiler. The benchmark takes several minutes of computer runtime, but the actual runtime can vary depending on the class of processor being tested. Dr. Jack Dongarra, in the Mathematics and Computer Sci-

ence Department at Argonne Labs, said he is willing to provide true copies of the benchmark to any users willing to share their results and comments with Argonne Labs. While a copy of the benchmark is free, users must supply the magnetic tape. Dongarra said he also has a report describing the benchmark that he is willing to send to

interested users. More information is available from Dongarra at the Mathematics and Computer Science Department, Argonne National Laboratory, Argonne, Ill. 60439.

■ **The University of Wisconsin** benchmark developed by a team of researchers at the University of Wisconsin. The benchmark was developed to evaluate the basic parameters of both single-user and multiuser relational data base management systems. The benchmark can reportedly be used to analyze any relational data base management system, including those based on IBM SQL or Relational Technology, Inc.'s Quel query language. The benchmark is available from the university on magnetic tape, which costs between \$250 and \$500 depending on how difficult it is to adapt the tape to user's system requirements. Tapes are available for single- or multiuser benchmarks and on Asid or Unix archival formats. More information is available from Prof. David DeWitt, Computer Science Department, University of Wisconsin, Madison, Wis. 53706.

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**STUDY** from page 101

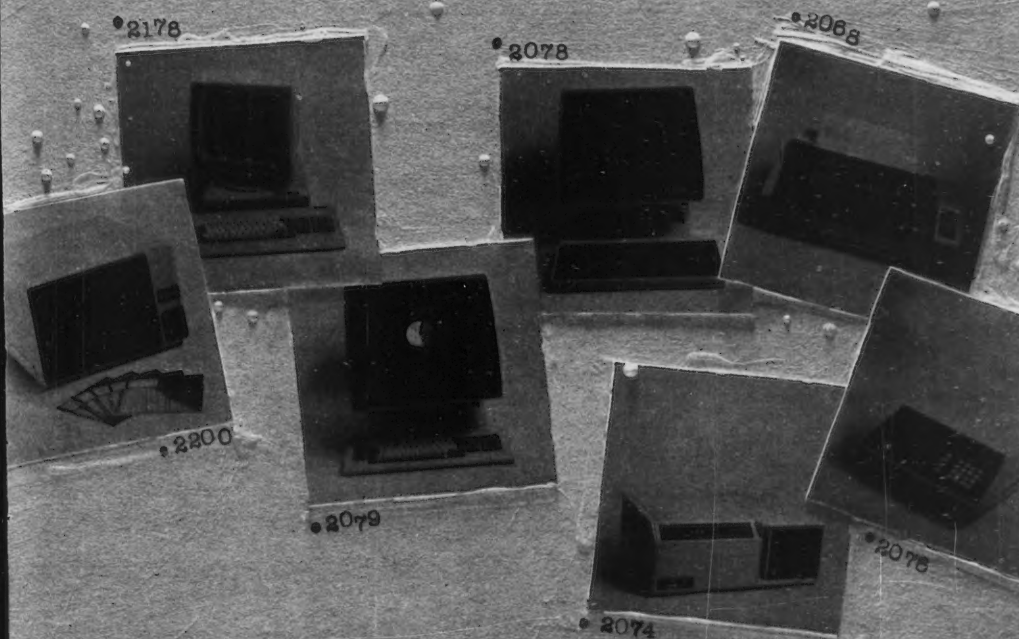
standing or performance improvement the report states. "Once IBM really addresses the protection and security problem, the mystery of what the operating system does and how it works will be sealed forever."

Preconfigured operating systems are a mixed blessing. In eliminating the need for systems programmers, they also eliminate the primary source by which users learn to understand IBM hardware and software systems.

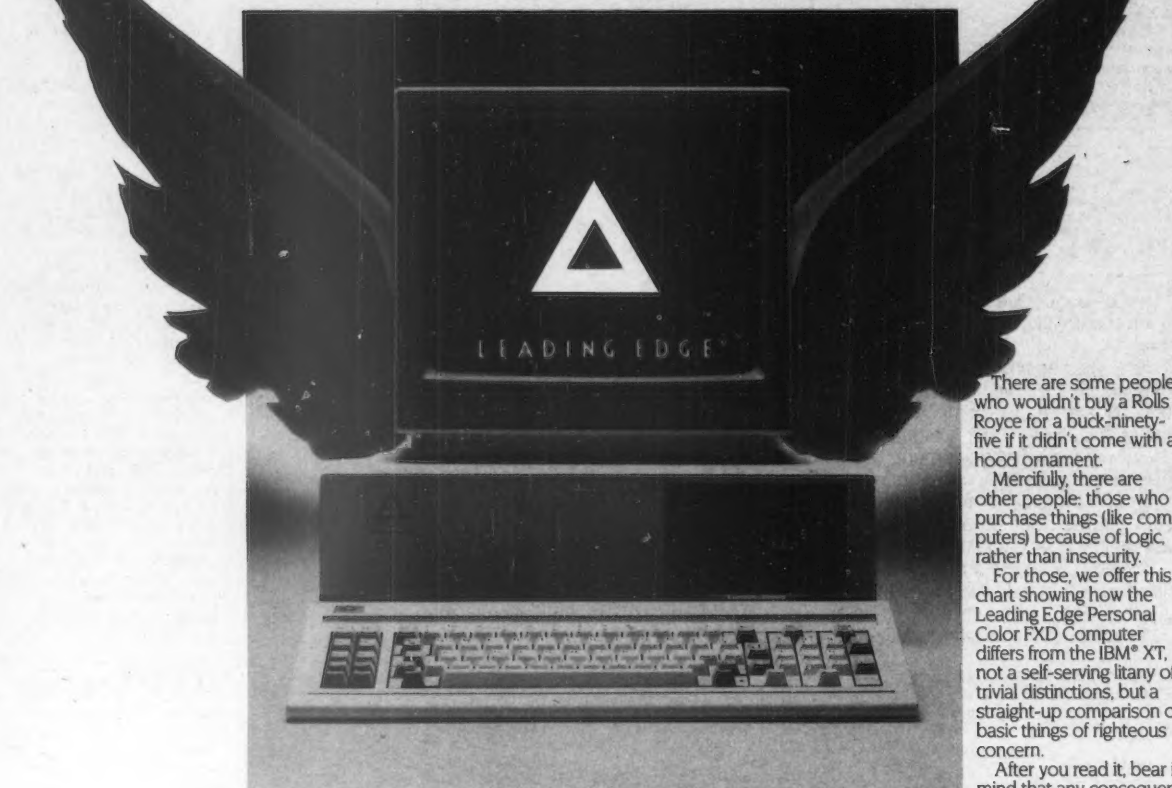
■ IBM's corporate strategy is large-mainframe-oriented. Mainframes and stand-alone peripherals account for 65.2% of IBM's gross revenue of \$40.2 billion, the report estimates. However, the report predicts magnetic disk storage will be a key growth area for IBM in the 1980s, and that IBM will attempt to slow the acceptance of optical disk systems that may affect magnetic storage revenue until 1988 or 1989. The major trend of the 1990s, the report suggests, will be toward paper reduction in the office.

■ Limits on growth include unanticipated burdens on host systems as central data bases grow and the probability of "catastrophic" central system failure resulting from demands for data made upon the system.

The full report is available for \$750 from Input, 1943 Landings Drive, Mountain View, Calif. 94043.



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There are some people who wouldn't buy a Rolls Royce for a buck-ninety-five if it didn't come with a hood ornament.

Mercifully, there are other people: those who purchase things (like computers) because of logic, rather than insecurity.

For those, we offer this chart showing how the Leading Edge Personal Color FXD Computer differs from the IBM® XT, not a self-serving litany of trivial distinctions, but a straight-up comparison of basic things of righteous concern.

After you read it, bear in mind that any consequent action you take requires only admirable lack of cowardice.

	<b>THE LEADING EDGE™ PERSONAL COLOR FXD</b>	<b>THE IBM XT WITH COLOR OPTION</b>
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<b>Memory</b>	256K Standard	256K Standard
<b>Speed</b>	7.16 MHz and 4.77 MHz Standard	4.77 MHz Only
<b>Expandability</b>	Expandable to 640K No additional boards	Expandable to 640K Must add two boards
<b>Graphics</b>	Capability Standard	With Color Monitor and Color graphic board
<b>Ports</b>	Both Parallel and Serial Standard	Serial Standard, Parallel optional—\$75.
<b>Expansion Slots</b>	7 slots Standard of which 3 remain open after expansion to 640K	8 slots Standard of which 1 remains open after expansion to 640K
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\*as of 9-10-84

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SOFTWARE DIVISION, 21 HIGHLAND CIRCLE, NEEDHAM, MA 02194. 800-343-3436. (617) 449-4655.

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# MICROCOMPUTERS

## HP replaces Model 150 with upgraded micros

Features include disk options, ability to swap data with IBM micros

By Jeffery Boeler  
CW West Coast Bureau

SUNNYVALE, Calif. — Hewlett-Packard Co. last week enhanced its original personal computer, the Model 150, with disk systems options and additional communications features that reportedly provide expanded ability to exchange data and files with IBM or IBM-compatible micros.

The enhancements, which include an Ethernet-compatible local networking facility and simplified commands, have prompted HP to replace the Model 150 with two upgraded personal computer models — the Touchscreen Personal Computer and the Touchscreen MAX.

From the standpoint of hardware and user interfaces, the two follow-on products are identical to the existing Model 150, except for their expanded disk capacities. The Touchscreen Personal Computer

reportedly comes with two 3¼-in. micro-floppy disk modules, each holding 710K bytes, while the Touchscreen MAX incorporates just one of the flexible diskette units plus a 15M-byte Winchester storage system. HP's original Model 150 supported dual 270K-byte microfloppy modules plus a 15M- or 5M-byte hard disk unit, the latter of which has been discontinued, according to Thayer Adams, the company's Touchscreen product manager.

HP also is providing a stand-alone 5¼-in. disk unit that enables users to swap programs and storage media between the Touchscreen family members and IBM Personal Computers, Adams said.

In addition to boasting enlarged disk capacities, the Touchscreen Personal Computer and MAX reportedly have been enhanced with assorted communications features, including a 3Com Corp. local networking capability that was unavail-

able with their HP predecessor.

The local networking facility reportedly now allows IBM and HP micros to be interconnected and to share expensive system resources like disk units and printers. In the past, the Model 150 and IBM's microcomputers were limited to point-to-point communication, according to Bruce Fujinami, a software support engineer with HP's Personal Office Computer Division.

Another communications feature added to the HP personal computer line is the ability to support Advance Link, an enhanced version of the company's existing DSN/Link facility.

Advance Link replaces and is a superset of DSN/Link, according to Andy Seligman, a product manager with HP's Personal Software Division. Like its predecessor, Advance Link allows the two Touchscreen

See HP page 122

■ Ryan-McFarland Corp. introduces Professional Fortran, an IBM Personal Computer implementation of Fortran-77/116

■ Northern Telecom, Inc. has announced an agreement to market Displayphones with Digital Research, Inc.'s Starlink multiuser micro system/116

### INSIDE

Software/120

## Project management may become major application

By Paul Korzenowski  
CW Staff

Alan Kessler, a product manager at microcomputer software supplier Analytica Corp., was forced to fit a square peg — a spreadsheet — into a round hole — his need for a project management package.

"I needed a project management system, so I designed one with [Lotus Development Corp.'s] 1-2-3," Kessler remarked. "It was a complicated task that involved complex programming and required a lot of time to test." The manager's model, which generated Gantt charts, was satisfactory for simple planning, but ran out of memory when more than 100 tasks were entered.

Kessler ended up trading his makeshift system in for Timeline, a project management system from Breakthrough Software Corp. in Novato, Calif. Breakthrough is one of a growing number of vendors gambling on the idea that project management may join WP, data base management and

spreadsheets as a major micro application.

"The market for project management is larger than that for spreadsheets or data bases," claimed Shakeel Mozaffar, director

*'The market for project management is larger than that for spreadsheets or data bases.'* — Shakeel Mozaffar, marketing director, Harvard Software, Inc.

of marketing at Harvard Software, Inc.

Putting project management functions on a micro avoids some drawbacks found in the mainframe world, where such software packages have been available for

years without gaining widespread acceptance, another software supplier said.

"Mainframes work in a bureaucratic fashion," said Joel Koppelman, president of Primavera Systems, Inc., a Bala Cynwyd, Pa., project management vendor. "They produce a number of beneficial reports, including status reports, but the user is unable to complete 'what-if' scenarios to determine if there is a better way to schedule a project or handle a problem."

Another limitation to mainframe project management systems is that users must work with complex mainframe software, Koppelman added. "Microcomputers will help project management gain popularity because they are much easier to use than mainframes," he said.

Microcomputer packages have been hampered by memory constraints, according to Breakthrough's Andrew Layman. "Some packages can store only a few hun-

See MAJOR page 122

## English commands integrated in six-function Xanaro package

NEW YORK — Ability, a six-function integrated software package for IBM Personal Computers that will sell for \$495, was unveiled here late last month by Xanaro Technologies, Inc. The package combines word processing, spreadsheet, a data base manager, graphics, telecommunications and presentation functions.

Xanaro President Robert Hryniak described the software as an "operating environment" package because it reportedly does not require users to learn operating system commands. The package is "the first operating environment software to integrate common English language commands for all six applications," Hryniak claimed.

Ability is said to permit easy access to all applications using one common work space, without the need for window displays. Among

other capabilities, this permits free intermixing of text, spreadsheet and graphics functions when in text mode, Xanaro said. In addition, Ability's selective linking between cells in different applications allows dynamic updating of data, according to the firm.

Ability's spreadsheet size is limited only by memory availability, Xanaro said. The graphics function reportedly produces five types of charts.

Size of data files in the relational manager is restricted by disk size, according to the supplier.

Ability also reportedly supports "what-you-see-is-what-you-get" word processing, which includes features such as on-screen display of bold or italicized characters.

The asynchronous communication

See XANARO page 121

## Suppliers still ignore the basics



**SMALL TALK**  
Eric Bender  
CW Senior Editor

Just as in the past, today's most glamorous microcomputer hardware and software designs are targeted at "power users."

In data processing, that's a self-contradictory term. But it does conjure up a definite image: those globe-trotting executives feverishly building spreadsheets (preferably ones with more cells than the average human body) and deciding to raise factories from Singapore to Scotland or corner the world supply of some strategic metal.

Over time, the desktop hardware in this image grows more powerful and often bulkier as well — for

example, the new IBM Personal Computer AT is noticeably bigger than the Personal Computer XT.

Size of the software programs, meanwhile, keeps climbing dramatically. This year's crop of high-profile business packages combines spreadsheets, data base management systems, graphics, text processing, communications and a host of miscellaneous functions in a monster, all-in-one package such as Lotus Development Corp.'s Symphony or Ashton-Tate's Framework.

These are inspired pieces of software, but most of them were not designed for general consumption.

By all accounts, Symphony is like the M-1 tank — fast, powerful, tricky and requiring lots of support. Users say that you can drive happily over the countryside, around or

See USERS page 122

## MICROCOMPUTERS

## Financial planning package for IBM micros out from BNA

WASHINGTON, D.C. — Income Tax Spreadsheet, the first in a series of financial planning packages focusing on taxation, has been introduced for the IBM Personal Computer by BNA Software, a division of the Bureau of National Affairs, Inc.

Income Tax Spreadsheet, written by a tax attorney and priced at \$495, is said to offer automatic calculation of net tax liability over seven years for all categories of individuals and fiduciaries. Program calculations reportedly include income averaging, alternative minimum tax and automatic indexing.

The software, which requires at

least 192K bytes of random-access memory and two disk drives (one double-sided), is said to provide multiple-year or multiple-case projections simultaneously and the capacity to use multilevel work sheets. Such work sheets permit entry of as much or as little detail as the user prefers without a rigid format, BNA Software said.

Help messages, displaying references to the Internal Revenue Service code, are also said to be included, as are changes of the 1984 tax code.

Additional information is available from BNA Software, 1231 25th St. N.W., Washington, D.C. 20037.

## Digital Research, Northern Telecom ink marketing pact

PACIFIC GROVE, Calif. — Digital Research, Inc. and Northern Telecom, Inc. have announced an agreement under which Northern Telecom will sell its Displayphone with Digital Research's Starlink network.

The package allows Displayphone users to connect to IBM Personal Computers and share files and software, according to the vendor. Starlink is said to connect four users and allow them access to programs running under either IBM's PC-DOS or Digital Research's CP/M operating system.

Users can transfer data between

Displayphone terminals, according to Digital Research.

Displayphone, a voice/data terminal, reportedly features a 90-number telephone directory, hands-free speakerphone, automatic logon, reminder service for appointments and a printer interface for hard copy.

The Starlink Displayphone system is available for \$1,800 per user.

Digital Research is located at 160 Central Ave., Pacific Grove, Calif. 94303.

Northern Telecom's address is 259 Cumberland Bend Road, Nashville, Tenn. 37228.

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<input type="checkbox"/> 3-Day Conference & Expo only (includes lunches)	\$195.00	\$195.00
<input type="checkbox"/> 1-Day Conference & Expo (includes lunch) (check one)		
<input type="checkbox"/> Tuesday <input type="checkbox"/> Wednesday <input type="checkbox"/> Thursday		
<input type="checkbox"/> Payment Enclosed <input type="checkbox"/> Bill me <input type="checkbox"/> Bill Company P.O. #		
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Signature _____		
Name/Title _____		
Company _____		
Address _____		
City, State, Zip _____ Phone ( ) _____		

## IBM micros get GSA-approved Fortran version

ROLLING HILLS ESTATES, Calif. — Ryan-McFarland Corp. has announced Professional Fortran, a Government Services Administration-certified, error-free, full implementation of Fortran 77 that runs on the IBM Personal Computer line, including the IBM Personal Computer AT.

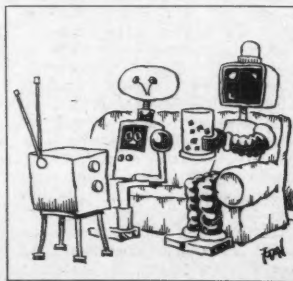
"Our benchmarks show that a Personal Computer AT using Professional Fortran can execute some programs virtually as fast as an IBM 4331 mainframe using [IBM] VS Fortran," said David McFarland, vice-president at Ryan-McFarland.

The product features Fortran language extensions, object code optimizations, a symbolic interactive debugger and support for arrays of unlimited sizes, according to the vendor. Extensions are said to include symbolic names of up to 31 characters, an INCLUDE statement, industrial real-time Fortran binary-pattern and bit processing functions, Hollerith and hexadecimal constants and mainframe application data types.

Statistical analysis, computer-assisted design, analytical graphics and performance graphics are typical Fortran applications, Ryan-McFarland said.

Professional Fortran works with an Intel Corp. 8087 or 80287 floating-point coprocessor.

Professional Fortran costs \$595. Ryan-McFarland is located at 609 Deep Valley Drive, Rolling Hills Estates, Calif. 90274.



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## MICROCOMPUTERS

## SOFTWARE

SOFTWARE STUDIOS, INC.  
Nifty

Software Studios, Inc. has announced Nifty, a desk management system that runs on the IBM Personal Computer.

The program includes an address and telephone file manager, appointment calendar, memo pad, calculator and phone dialer.

The address and phone manager reportedly possesses mail merge capability. The manager also provides an alphabetized phone directory and automatic dialing capability, according to the vendor.

Nifty features a log of system use, on-screen preview before printing, Zip code or record number sorting

and global search by name, firm or record number, the vendor said.

Nifty costs \$75 plus \$2 for shipping and handling.

Software Studios, 8516 Sugarbush, Annandale, Va. 22003.

INTEGRAL TECHNOLOGIES  
CORP.  
DBXREF

Integral Technologies Corp. has introduced DBXREF, an applications development tool for use with Ashton-Tate's Dbase II data base management system. It reportedly runs on the IBM Personal Computer and Personal Computer XT, all machines running Digital Research, Inc.'s CP/M 86 and most systems running Digital Research's CP/M 2.2.

DBXREF assists with the development of documentation and aids in

the debugging of Dbase II programs, especially those with a large number of variables, according to the vendor. The software reportedly provides cross-references for the calling program and all subprograms and provides a calling tree and a line-numbered program listing to aid in updates.

Its trace feature is said to permit the selection of specified fields, file names or variables for cross-referencing.

DBXREF is priced at \$95.

Integral Technologies, Suite 1, 9201 Penn Ave. S., Bloomington, Minn. 55431.

SOFTWARE CONNECTIONS,  
INC.

## Datastore:file

Software Connections, Inc. has in-

troduced Datastore:file, a menu-driven file management program for the IBM Personal Computer, Texas Instruments, Inc. Professional, Hewlett-Packard Co. Model 150 and the NCR Corp. Decisionmate.

Datastore:file reportedly offers a built-in report writer and is file-compatible with other members of the firm's Datastore family of data base management systems.

The program is said to create up to 65,000 records per file and 150 fields per record. Calculations that can be performed reportedly include counts, totals, averages and the minimum and maximum number in a data base.

Datastore:file is said to contain a context-sensitive Help facility and a reference facility able to provide the page number for the user manual.

Datastore:file is priced at \$195.

Software Connections, 2041 Mission College Blvd., Santa Clara, Calif. 95054.

SOFTWARE ARTS, INC.  
TK! Solver for Macintosh

Software Arts, Inc. has introduced a version of its TK! Solver software for the Apple Computer, Inc. Macintosh computer.

Like other versions of TK! Solver, the software reportedly permits iterative problem solving, list solving, automatic unit conversion and the generation of tables and graphs.

The Macintosh version reportedly permits use of the machine's mouse as a pointing device, performs high-resolution plotting and provides answers with 12-digit precision.

TK! Solver for the Macintosh is priced at \$249.

Software Arts, 27 Mica Lane, Wellesley, Mass. 02181.

MAINSTAY  
Macasm

Mainstay has introduced its Macasm software, an assembly language development system for the Apple Computer, Inc. Macintosh computer.

Macasm is said to offer an integrated, full screen work environment, including an integrated editor/macroassembler with resource compiler. It is also said to include full macro capability and to permit assembly language programming structures similar to higher order languages. Source code reportedly may be assembled from memory or disk to memory or disk.

According to the vendor, Macasm is compatible with the Apple Macwrite software.

Macasm is priced at \$100.

Mainstay, 28611B Canwood St., Agoura Hills, Calif. 91301.

PERSONAL CAD SYSTEMS, INC.  
Cadplan 1.40HR

Personal Cad Systems, Inc. has announced an enhanced high-resolution update of its computer-aided design software for IBM's Personal Computer, Personal Computer XT and Personal Computer AT, running on IBM's PC-DOS 2.0 operating system.

Cadplan 1.40HR is used to create, edit and plot designs for architectural renderings, floor plans, piping, wiring, furniture placement, mechanical design, drafting and graphics-oriented documentation.

Cadplan 1.40HR has increased resolution from 320 by 200 pixels to 640 by 400 pixels and supports high-resolution graphics boards made by Scion

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If there's one thing you don't need, it's an on-line COM printer that makes you alter your host computer's software. Unfortunately, that's exactly what most systems make you do.

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COM DIVISION



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## MICROCOMPUTERS

Corp., Sigma Design, Inc., Hercules Computer Technology and Conographics Corp. — vendors whose boards work with Electrohome, Ltd., Hitachi America, Inc. and Mitsubishi Electronics America, Inc. monitors.

Other enhancements include node and vertex locking, fillets, user-definable data base units, cross-hatching and a floor-plan package.

Base price of Cadplan 1.40HR is \$1,300 for new users and no cost to existing license holders.

*Personal Cad Systems, 981 University Ave., Los Gatos, Calif. 95030.*

## DATA BASE DECISIONS

## Periscope

Data Base Decisions has introduced Periscope, a debugging system for the IBM Personal Computer, Personal Computer XT and Compaq

Computer Corp. systems.

Periscope is said to be a symbolic debugger with a system monitor and a breakout switch. It supports assembly, Basic C, Pascal and other programming languages, Data Base Decisions said.

Periscope reportedly includes a memory board for one of the Personal Computer's expansion slots, two push-button breakout switches, the debugging software and a 100-page manual. The breakout switch is reportedly used to interrupt currently executing programs in order to allow the debugging software to be introduced.

Periscope is said to be command-driven and to preserve the program's screen, even on a one-monitor system.

It is priced at \$295.

*Data Base Decisions, 14 Bonnie*

*Lane, Atlanta, Ga. 30328.*

LOTUS DEVELOPMENT CORP.  
Data General/One version of 1-2-3

Lotus Development Corp. has announced a version of the 1-2-3 spreadsheet that runs on the Data General/One portable computer.

Although the DG portable claims to be IBM Personal Computer-compatible, it uses 3¼-in. diskettes while the IBM microcomputer has 5¼-in. disk drives. The 1-2-3 for the DG portable is written on 3¼-in. diskettes, Lotus Development said.

To run 1-2-3, two disk drives and a minimum of 256K bytes of random-access memory are required, according to the vendor.

1-2-3 costs \$495.

*Lotus Development, 161 First St., Cambridge, Mass. 02142.*

XANARO from page 115

tions application provides standard capabilities such as automatic dialing and also gives emulation of Digital Equipment Corp. VT100 and VT52 terminals, the company said.

Ability's presentation function permits users to develop slide-like presentations.

Other features include on-line context-sensitive Help, the ability to customize up to 30 macro commands and support of the Intel Corp. 8087 mathematical coprocessor.

Ability runs under IBM's PC-DOS operating system and requires 256K bytes of random-access memory, two floppy disk drives, a color card and a color monitor.

Xanaro is located at Suite 815, 321 Bloor St. E., Toronto, Ont., Canada M4W 1G9.



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## NCR

NCR Comten, Inc.

## MICROCOMPUTERS

**USERS** from page 115

through normal obstacles, but then realize that you don't know where you are.

That's a difficulty with some other excellent all-in-one programs as well. They may be advertised on television or in extensive print campaigns as "perfect for first-time users as well," but that's nonsense. They're often closer to programming tools than they are to general-purpose packages.

This class of software requires a lot of training and support, and it's needlessly complicated for the tasks most people want to do on a personal computer.

**Fraction of commands**

As one illustration, most people working with Lotus' 1-2-3, a much simpler program than Symphony, use only a small fraction of the available commands.

Getting the power of the computer to nonpower users is still the big

challenge.

That's old news, but it requires a lot of painstaking and rather dull work, and it's still rare for vendors to put their best personnel on the job of checking all the little details.

**Documentation lacking**

Look at something as simple as on-disk tutorials. Sometimes all it takes to run these is to put them in the default drive and type a few characters, but the documentation doesn't even tell you that.

Documentation for almost all new hardware and software offerings still abandons you at several crucial points. And an astonishing percentage of new products turns up with major defects or simply does not run at all.

Power users, or anyone else who makes the effort, can overcome these problems. But there's a vast market open to suppliers who provide bulletproof, user-friendly features and follow through on the details.

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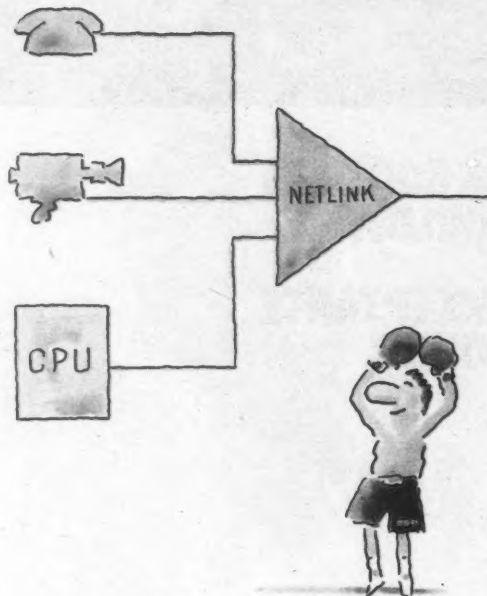
It can handle speeds of 50 bps to 2,048 million bps and transmit voice at low speeds without losing quality or speech recognition.

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For more information, write DCA, 303 Research Drive, Norcross, Georgia 30092. Or call toll-free: 1-800-241-5793.

**MAJOR** from page 115

dred tasks in a project," Layman said. "When a project is that small, it would be more economical to use pencil and paper than a micro."

But these limitations will be overcome as more sophisticated microcomputers emerge, other vendors agreed. "Memory limitations were not a serious problem with the [IBM] Personal Computer XT and will be even less of a problem with the [Personal Computer] AT," Koppelman noted.

As memory problems are eliminated, user recognition represents the chief hurdle that project management faces, according to one analyst.

Maureen Fleming, an analyst at International Resource Development, Inc. of Norwalk, Conn., stated that people simply do not buy a micro to run project management software.

"Project management software is designed for someone who has worked with a computer for some time," she claimed.

**HP** from page 115

models to exchange files with IBM Personal Computers and HP 3000 minicomputers either over phone lines or direct cable connections.

Advance Link is said to support several enhancements that DSN/Link lacked. Advance Link, for example, permits certain communications processes that used to require constant human intervention to be activated automatically at a prearranged time and to run unattended, Seligman said.

The facility also simplifies the process of linking micros to public or private data bases by abbreviating the command sequences needed to invoke the appropriate instructions, he added.

In addition, the firm said that the Touchscreen Personal Computer and MAX can transfer files to an IBM host processor while emulating a 3278 terminal. The Touchscreen Personal Computer and MAX are available immediately, for \$3,495 and \$5,495 respectively.

HP is headquartered at 3000 Hanover St., Palo Alto, Calif. 94304.

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# COMPUTER INDUSTRY

## DEC gears up to market business 'solutions'

By Peter Bartolik  
CW Staff

MERRIMACK, N.H. — Digital Equipment Corp., claiming to have departed the "commodity" microcomputer business to focus on offering "solutions," recently unveiled a marketing strategy to coordinate the efforts of resellers, dealers and its own Business Centers.

Executives at DEC's Business Computer Group (BCG) based here acknowledged in a recent interview that the company was swept into a price-competitive, commodity personal computer market for which it was philosophically and strategically unprepared.

BCG was formed this past July to unite DEC's Commercial OEM Group, Small Business Group and the retail operations of the Personal Computer Group. Personal computer responsibilities were reassigned to groups serving the small business, large business and technical markets.

In attempting to compete on retail shelves alongside IBM, Apple Computer, Inc. and IBM clone products, said Ward MacKenzie,



MacKenzie

vice-president of BCG, "We weren't successful, and our strategy should have told us we weren't being successful."

John O'Keefe, marketing manager of BCG, said the company failed to recognize the commodity nature of the personal computer retail market. "We never believed we were in a commodity market," he said.

MacKenzie, a 17-year DEC employee, was group manager of DEC's Commercial OEM, Technical OEM and Microcomputer Product Groups prior to assuming his current position, where he still retains responsibility for those other groups.

MacKenzie said the company has refocused its strategy on earlier strengths for meeting business needs, rather than competing in mass markets. "We are less well known in the commodity 'buy-it-off-the-shelf' markets. When we get to the professional market, we are much more known," he said.

According to MacKenzie and O'Keefe, research conducted internally and by commissioned research firms indicates the target

See DEC page 137

■ Press baron Rupert Murdoch brought more than controversy into the U.S. when he moved into the New York Post building. He also brought along an Australian computer company/127

■ Management Science America, Inc. recently found itself involved in a legal dispute with the founder of a company it acquired a year ago/129

■ Conflicting signals from IBM's Boca Raton, Fla., facilities are said to cause confusion among software developers/130

## Rolm workers hope IBM buy will not mean corporate hassles in paradise

By Kathleen Burton  
CW West Coast Bureau

SANTA CLARA, Calif. — The day after IBM made a \$1.25 billion takeover offer for Rolm Corp., Rolm employees revealed a mixed reaction to the impending merger with the largest company in the computer and information processing industry.

Rolm offers its workers a melange of benefits that include whirlpools, steam rooms, tennis and racquetball courts, a full-size indoor basketball gymnasium, a liberal flex-time program and a three-month sabbatical-with-pay after six years of employment. Employees were ques-

tioned about how they think the Rolm culture will fit in with IBM's conservative, button-down corporate image.

"There are a lot of jokes going around the company now about IBM sending over dump trucks to fill in our swimming pool and about a 'white shirt 'n wing tips' sale going on in the parking lot," said Robert Berger, manager of Rolm's Marketing Literature division. "People are definitely nervous. I think the jokes make them feel better."

Berger said the merger makes sense to both companies because "Rolm's only a

See RESPONSE page 124



INDUSTRY INSIGHT  
Peter Bartolik  
CW Senior Editor

## Will anyone meet the IBM challenge?

If the computer industry had any similarity to more established industries such as oil or steel, IBM's proposed acquisition of Rolm Corp. would set off an epidemic of merger mania as would-be competitors scrambled to stay even.

But the nature of the computer industry, and the preeminence of IBM, set this business apart from the Seven Sisters of the oil industry and the rusty titans of the steel business.

IBM, as we have been hearing from John Akers, its president and chief executive officer-designee, is only a \$40 billion company in a \$250 billion business. "The industry dwarfs [IBM]," he has said more than once. How he manages to say that and keep a straight face is yet one more marvel in the mythology of IBM.

Look around this industry and try to find another player that is in the \$40 billion category. There is only one, AT&T, and it is a neophyte in this business; many questions remain as to its

See IBM page 137

## Vector Graphic on the block

THOUSAND OAKS, Calif. — Vector Graphic, Inc. recently said it would seek to be merged or acquired following its report of an operating loss of \$7.6 million, or \$1.18 per share, for the year ended June 30.

The loss compared with a year-earlier loss of \$2.9 million, or 51 cents per share. Revenues for the year just ended were \$15.1 million, compared with \$33.1 million a year earlier.

The company said its independent

public accountants issued a qualified opinion for the year just ended in light of the company's continuing losses and liquidity problems.

Jean Deleage, company chairman, said Vector Graphic took significant steps to reduce operating expenses, address operating problems and provide the Microsoft Corp. MS-DOS operating system on its products, but nevertheless has "encountered an increasingly difficult and com-

See LOSS page 137

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Signal Technology's Process Accounting and Chargeback System (PACS) is the leading system resources management software for Digital Equipment Corp's VAX/VMS system configurations.

PACS and its complementary packages EZTRACK and EZLOG were designed to do two things very well: to let you know how your VAX is being used and to allow

you to assign charges for that use. But it is the way in which the software lets you perform these functions that sets PACS and its complements apart.

That is because it lets you decide how you want to view system resources and accounting data. It lets you select by user, project session/image—and up to thirty other qualifiers for examining any system resource. A report writer processes the resource data in any configuration determined by the selection criteria, giving you a flexible approach to system housekeeping. Departments within your organization

may be charged for their time and disk usage of the computer. But even if charges are not assigned, you still have the capability to examine current usage and to anticipate future demands on the system. You may also wish to communicate allocation data to other departments. This may help them better plan their time on the system and give additional input on ways to increase coordination computer usage among departments.

System resources which can be examined include disk storage, connect time, CPU time, I/O transfers, and port speed.

PACS lets you examine the factors that affect the smooth operation of a data processing department. It lets you plan for future system requirements. And it increases "usage awareness" among all departments.

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## COMPUTER INDUSTRY

**RESPONSE** from page 123

small company with approximately \$660 million in sales that's trying to compete with a \$34 billion giant like AT&T; and IBM needs somebody like Rolm that's a specialist in business communications." Berger said he expected few IBM-mandated changes here.

"Why change something that works? IBM knows we're hot," he said.

**Former IBM employee**

Jim Cockrum, general manager of Rolm's Network Products division, worked at the IBM Advanced Systems Development division in Los Gatos, Calif., before leaving to join Rolm in 1982.

"IBM's East Coast, button-down corporate culture is a myth left over

*'There are a lot of jokes going around the company now about IBM sending over dump trucks to fill in our swimming pool and about a "white shirt 'n wing tips" sale going on in the parking lot. People are definitely nervous. I think the jokes make them feel better.'*

— Robert Berger, manager of Rolm's Marketing Literature division.

from the 1950s," he claimed. "In matters of style and image, IBM and Rolm basically aren't that different. Line up 10 IBM managers and 10 Rolm managers, and you can't tell the difference."

Cockrum seemed pleased with the announcement. "It's a positive move, a synergy between computers and

communications. The customers will win because now we'll create better products," he said.

Some Rolm employees seemed stunned by the turn of events, however.

"It's really too soon to tell what's going to happen. I was totally unprepared and shocked, though I don't

think we'll see any changes at my level for one or two years," said George Brinkman, a customer support technician at Rolm's Field Operations Division. Brinkman confessed that IBM's stoic image had him worried.

"I've never heard of IBM having beer busts and champagne outings. They don't seem to party as a company the way we do at Rolm. I'd sure miss those things if [IBM] canceled them," he said.

Judy Westphal, an administrative assistant in Rolm's warranty repair/field services department, said she had been worried until Rolm President Ken Oshman held a company-wide question-and-answer session the day of the announcement. "His speech really calmed me and a lot of other people," she said. "It was like family."

The meeting went on for hours, Westphal said, "and people wouldn't

*'It's a positive move, a synergy between computers and communications. The customers will win.'*

— Jim Cockrum, general manager of Rolm's Network Products division.

stop asking questions. Oshman said part of the negotiations were that IBM would preserve the unique culture [at Rolm]. That made me feel better."

Mike Harris, editor of Rolm's *Network* magazine, said many Rolm insiders felt an IBM takeover was inevitable after IBM bought 23% of the company's stock, but the timing was a surprise.

"They say nothing's going to

*'It's really too soon to tell what's going to happen. I was shocked, though I don't think we'll see any changes at my level for one or two years.'*

— George Brinkman, a customer support technician at Rolm's Field Operations division.

## TIME

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## COMPUTER INDUSTRY

amount of stock when he joined Rolm two years ago. "I'm really high right now. I've got to decide what to buy," he said.

According to Nolte, many Rolm employees will make small fortunes with the takeover. Nolte said he and his friends planned a modest celebration. "We'll tie one on to celebrate," he said.

**'[Rolm President Ken Oshman's] speech really calmed me and a lot of other people. He said... IBM would preserve our unique culture.'**

— Judy Westphal, an administrative assistant in Rolm's warranty repair/field services department.

Utilizing a company open-door policy instituted for the transition, Nolte said he went to see his manager four times in two days to discuss his stocks and tax questions.

"I have to call the [Internal Revenue Service] too," he said. "The stock situation is really confusing."

Joyce Gregory, a programmer/analyst with Rolm's Business Communications Organization division for 4½ years, expressed strong feelings of loyalty to Rolm, coupled with a prag-

**'They say that this lifestyle is too good to tamper with, but that might be a story on par with "the check's in the mail."'**

— Mike Harris, editor of Rolm's *Network* magazine.

matic wait-and-see attitude.

"It's still business as usual for me," she said as she hurried to a lunchtime marketing meeting on the other side of the Rolm campus. "I wouldn't bail out now though," she said.

"I'm not expecting it to impact us for a while." Dressed casually, Gregory said she was not concerned about

**'I'm really high right now. I've got to decide what to buy... We'll tie one on to celebrate... I have to call the IRS too; the stock situation is really confusing.'**

— Jim Nolte, senior technical writer.

IBM's supposedly stricter dress code. "IBM's a sophisticated company, and it knows what's important and what's not," she said.



## EXECUTIVE CORNER

**Richard H. Quast** has been named vice-president, manufacturing of Cadlinc, Inc.

**Robert D. Mead** has joined Lisp Machine, Inc. as vice-president, manufacturing.

**Donald J. Shapiro** has been named vice-president and general manager, advanced products division, and **Chester C. Fennell Jr.** has been named vice-president, networking and office automation products at Datapoint Corp.

**Gregory L. Casto** has been named

vice-president, systems and services at Magnicom Systems.

**Dr. Peter R. Bono** has joined Graphic Software Systems, Inc. as director of strategic technology.

**Abel J. Schall** has been named director of international operations at Ridge Computers, Inc.

**James J. Bochnowski** has been appointed to board chairman and acting chief executive officer at Synapse Computer Corp.

**Adrian King** has joined Microsoft Corp. as product manager of the Microsoft Xenix operating system.

**Robert E. Vernon** has been named vice-president of office information systems at Sperry Corp.

**Robert R. Weiss** has been appointed president and chief executive officer at Multimate International Corp. Multimate also announced additions to its company management team: **Richard A. Lefebvre** as senior vice-president of operations and finance and **Robert H. Sommers** as senior vice-president of marketing and sales.

**Joseph Gaynor** has been elected executive vice-president of sales and marketing and chief operating officer at Tek-Com Corp.

**Edward H. Browder** has been named chief executive officer for Falco Data Products, Inc.

**Ira Poser** has been promoted to director of electronics defense software at the avionics division of ITT.

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## COMPUTER INDUSTRY

## EEC to lessen high-tech gap through R&amp;D legislation



**OUTSIDE LINES**  
Alonzo D. Saunders

*First in a two-part series.*

**A**lthough Europe has established a legal Common Market, that market does not yet, in fact, fully exist because harmonization — making national laws consistent with European Economic Community (EEC) law — is still a faraway goal. The legal and marketing reality is that harmonization is a two-edged sword. The first edge cuts away at national barriers to trade,

while the second is being honed to ensure the EEC's high-technology competitive edge.

Specifically, it is well known that the EEC is acutely concerned about its weaknesses in advanced technology. The first step to close the gap was legislation that would make it easier for competitors to share research and development technology. The proposed draft of the law is reportedly to be made final by the end of 1984. Although the law's intent has been well received, many industry sources believe it does not go far enough.

The main objection is that large high-technology companies, which presumably have the greatest capa-

bility of making R&D breakthroughs, are not included. There is also criticism over the fact that market-sharing agreements, which are often coupled with R&D agreements, are not included and neither is a proposed exemption for patent agreements, although this omission could be remedied rather quickly.

To others, the good news about the law is that the preclearance procedure for joint ventures is, as in America, an idea whose time has finally come and that information technology and biotechnology ventures will probably be favorably viewed by the EEC's antitrust commission. Last, but not least, there is currently no limitation on the dura-

tion of any R&D agreement approved under the procedure.

Via the Esprit program, the EEC is also investing heavily in its own sponsorship of R&D, particularly information systems, telecommunications and biotechnology. The program was funded at 1.5 billion ecus over five years starting in 1983. (An ecu is the European Currency Unit, a weighted basket of European currencies equal to approximately 80 cents.)

Millions of dollars are currently being invested in software development, micro electronics, and biomolecular technology. This program, probably one of Europe's highest profile attempts at closing the technology gap, is a joint venture of the EEC and a number of European high-technology giants, including Olivetti Corp., Philips Information Systems, Inc., CGE-France and International Computers Ltd. of England, to name a few. Europe, like Japan, is forging the legal implements necessary to make itself a greater competitive force.

The Esprit program also encompasses a different form of harmonization — harmonization of technology itself rather than of the laws relating to technology. This approach exists in the so-called Info-tech Standards Law, written with the assistance of the Industrial Standards Organization and the Consultative Committee on International Telephone and Telegraph. The object of the law is simply to standardize differences in equipment.

#### Effect of law

Some European manufacturers reportedly admit that the effect of the law will be to hinder IBM's (read America's) position, but it is also true that American firms are active in this standardization process. EEC officials have downplayed the anti-competitive effects of standardization, as have U.S. officials.

Europe's copyright laws are still governed by the Vern Convention of 1886. A discussion paper to address the impact of new technology on copyright law is anticipated by the end of 1984. Special attention will be given to home video recording and protection against software piracy, which are issues of acute importance to American companies. In the interim, the EEC will, among other things, attempt to harmonize differences between the length of time protection is allowed for EEC copyrights, royalty rates and the agency issue of the persons by whom those royalty rights are negotiated.

Regarding merger and acquisition activity, proposed regulations would give the EEC the right of prior notification and approval of mergers where sales exceeded 750 million ecus. This threshold amount is a 50% increase over the previous threshold, but there is the take-away provision of a combined market share of 20%. Adoption of this provision is uncertain this year, but the proposal, at least from the EEC point of view, is going in the right direction.

*Saunders is a Boston-based attorney with a practice focusing on international marketing, antitrust issues and corporate finance.*

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## COMPUTER INDUSTRY

# Computer Power Group establishes U.S. market base

## Murdoch's investment in Australian firm helps solidify its multinational orientation

By David Olmos  
CW Staff

FRAMINGHAM, Mass. — The Computer Power Group name is better known in Australia than in the United States, and one of its owners, Rupert Murdoch, is more easily identified as a publishing mogul than a computer baron.

But Dr. Ted Prince, chief executive officer of Computer Power Group Pty., Ltd.'s newly established U.S. subsidiary, Computer Power, Inc., would like to change all that.

Computer Power, one of Australia's largest computer services firms with a specialty in systems software, recently set up shop in the New York Post building. The New York office will serve as a base for the privately held concern to market its products and services in North America.

Computer Power's move to the U.S. came shortly after Murdoch, the controversial Australian whose worldwide publishing empire includes the New York Post, purchased a one-third share in the Melbourne, Australia-based firm.

*'If you want to expand, you've got to become multinational. . . . Expanding in computers means expanding in the U.S.'* — Dr. Ted Prince, chief executive officer, Computer Power Group Pty., Ltd.

Prince described Murdoch's purchase as friendly and noted that he "has left us very much on our own."

In a recent interview here, Prince said Murdoch's investment — for an undisclosed amount — helped speed Computer Power's move to the U.S. The publisher's involvement has not only helped provide a roof over Computer Power's head, but has also provided other important corporate resources. As Prince put it, "We've got all the advantages of a small company, like flexibility and entrepreneurial flair, with the advantages of a big company, too."

While Murdoch's involvement was obviously a boon, Prince pointed out that "even if we'd come [to the U.S.] without Murdoch, I still would have been confident of our ability."

Prince came to Computer Power from his job as director of data processing for Australia's Department of Social Security, where he played a key role in developing the agency's Stratplan, a giant office automation network and the largest computer project ever undertaken in Australia.

Computer Power, which has marketing arms in Europe and Southeast Asia, expects to have \$50 million in revenues this year. The move to the U.S., Prince said, is seen as a way to help the company grow.

"If you want to expand, you've got to become multinational," he said. "Expanding in computers means expanding in the U.S."

Prince said the company carefully evaluated the U.S. market before its decision. "For us to market anything over here, it has to be unique and totally certain for success," Prince said. "We're not here for patriotic duty, we're here as businessmen."

The first product the company chose to introduce in the U.S. market was a text information and retrieval software program called Status. Prince claimed that Status is the only text retrieval package available that needs no modification of code to operate on a variety of systems, ranging from an IBM Personal Computer up to mainframes manufactured by

IBM and Burroughs Corp. Computer Power's research group in Australia is developing a natural language front-end for Status, expected to be ready sometime in 1986, he said.

The basic program from which Status was derived was developed by a government agency in Great Britain about eight years ago. Computer Power has made major modifications to the program, which is used by about 150 organizations in Europe and Asia, according to Prince.

Prince said he is optimistic about the company's chances for success in the competitive U.S. software market. He noted that the firm is working

on projects for AT&T and Boeing Computer Services Co.

Computer Power also plans to market products from other Australian high-technology companies in North America. If the company is successful in the U.S., it could play a role in expanding Australia's presence in the industry.

A major study by Australian consultants recently recommended that the government spend \$170 million (Australian) in order to establish a national strategy over the next five years to bolster its information technology industry and gain a bigger slice of the export market.

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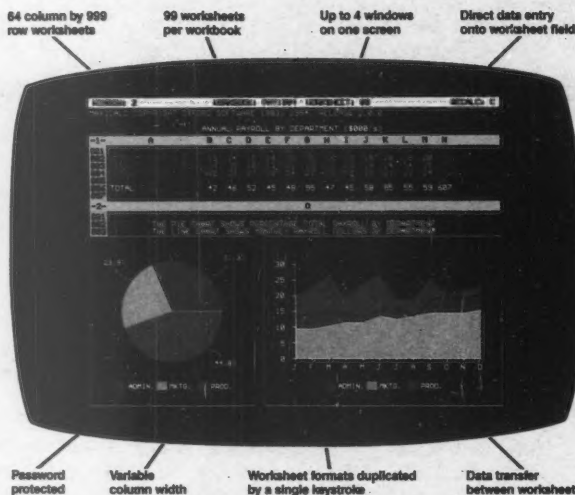
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## Restraining orders postpone proposed Edudata takeover

MINNEAPOLIS — Scientific Computers, Inc. (SCI), resisting a so-called hostile takeover attempt by Edudata Corp., said recently that a Minnesota District Court had issued a temporary restraining order barring Edudata from proceeding with its tender offer as it pertains to Minnesota residents. Subsequently, the company said, the U.S. District Court in Minnesota also issued a temporary restraining order barring the tender offer.

SCI's board of directors had announced that it intends to resist the tender offer and that it has sched-

uled a meeting on Nov. 15 for shareholders to vote on Edudata's tender offer. Edudata currently owns beneficially 454,550 shares of SCI's 1.4 million outstanding shares.

SCI also said the Minnesota commissioner of commerce issued an order suspending the takeover offer pending an Oct. 4 hearing.

SCI said Minnesota law requires that such an acquisition be approved by the holders of a majority of SCI stock, excluding stock beneficially owned by Edudata.

Further court hearings are scheduled for mid-October.

## National Semi posts increase in revenues

SANTA CLARA, Calif. — National Semiconductor Corp. recently reported a second-quarter profit of \$35.9 million, or 40 cents per share, compared to a year-earlier profit of \$10.9 million, or 14 cents per share.

Revenues for the quarter ended Sept. 16 were \$529 million, compared to \$432.5 million a year earlier.

The profits included an extraordinary gain of \$3.9 million, or 4 cents per share, resulting from tax code changes eliminating deferred taxes incurred by domestic international sales corporations.

National Semiconductor Chairman Charles E. Sporck said the present state of the U.S. economy "means continued growth in the U.S. semiconductor industry, and National will be a key participant."

## AT&T division reorganized

NEW YORK — AT&T Information Systems recently announced a reorganization creating three units, each responsible for product development, marketing and sales. The three divisions named are: Large Business Systems, Consumer and General Business Systems and Computer Systems.

Richard C. Holbrook, formerly operations vice-president of AT&T Information Systems' marketing and sales division, was named president of Large Business Systems. Victor A. Perlson, formerly president of AT&T Technologies' Consumer Products Group, was named head of Consumer and General Business Systems. James D. Edwards, formerly president of strategic, business and market planning with AT&T Technologies, was named head of Computer Systems.

The move follows by about one month the promotion of Robert J. Casale from president of AT&T Information Systems division for marketing and sales to executive vice-president for financial and strategic planning [CW, Oct. 1].

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## COMPUTER INDUSTRY

## Edu-Ware founder files \$11.5 million suit against MSA

### Suit charges MSA executives deliberately operated subsidiary unprofitably

By Maura McEnaney  
CW Staff

LOS ANGELES — The founder of Edu-Ware Services, Inc. recently filed an \$11.5 million suit against Management Science America, Inc. (MSA), which bought Edu-Ware last year.

Attorneys for Edu-Ware founder Sherwin A. Steffin charged MSA and its executives with breach of contract, securities fraud, conspiracy and violation of agreements. The suit, filed in U.S. District Court here, charged that MSA and seven executives and directors, including President William Graves and Senior Vice-President Larry Smart, violated the Securities Act of 1933 and the Securities Exchange Act of 1934.

The suit alleged that MSA made "fraudulent representations" to Edu-Ware's shareholders to in-

duce them to sell their stock in exchange for MSA stock, and that MSA made a promise of future payments, which, the suit claimed, never materialized.

MSA's Smart said the company's lawyers were in the process of responding to the charges. The company is protected by its contract with Steffin, Smart said. "We've basically got a disgruntled employee," he added.

According to the suit, when MSA made its move to acquire the small educational software publisher in July 1983, Steffin conveyed 75,000 shares of Edu-Ware stock to MSA in exchange for shares of MSA common stock.

In addition, the suit noted, MSA agreed to pay Steffin a percentage of Edu-Ware revenues and to retain the founder as an employee of MSA, working on research and development and public rela-

tions for the new software subsidiary.

However, the suit claimed several business decisions made by MSA and its directors deliberately forced depressed sales at Edu-Ware, thereby diminishing payments to Steffin which were to be based on the subsidiary's profitability.

The suit stated: "[The] defendants intentionally operated Edu-Ware unprofitably, provided Steffin little responsibility as an employee of Edu-Ware, ignored his advice and opinions, severely restricted his discretion regarding computer purchases, made many Edu-Ware personnel and staffing decisions from MSA's office in Atlanta, ... moved all manufacturing of Edu-Ware software products to the MSA home office in Atlanta and claimed that Steffin voluntarily terminated his employment relationship with Edu-Ware."

## Wang to receive AEA 1984 Medal of Achievement

PALO ALTO, Calif. — Dr. An Wang, chairman and founder of Wang Laboratories, Inc., will receive the 1984 Medal of Achievement from the American Electronics Association (AEA) at its Oct. 30 annual meeting in Boston, the AEA announced.

AEA Chairman Dean O. Morton, chief operating officer of Hewlett-Packard Co., said "Dr. Wang is being recognized for his contributions of both time and financial aid to educational institutions, the community and the arts," in addition to his technical achievements.

Wang came to the U.S. from China in 1945 and earned a doctorate in applied physics from Harvard University in 1948. In 1951, he formed his company and worked on development of magnetic core memory.

## Honeywell to make array

COLORADO SPRINGS — Honeywell, Inc. announced recently that it will make a 20,000-gate Cmos gate array for a supercomputer currently under development by ETA Systems, Inc.

Honeywell said that the gate array, which has been designated the HGC20000, will be made by Honeywell's Solid State Electronics Division.

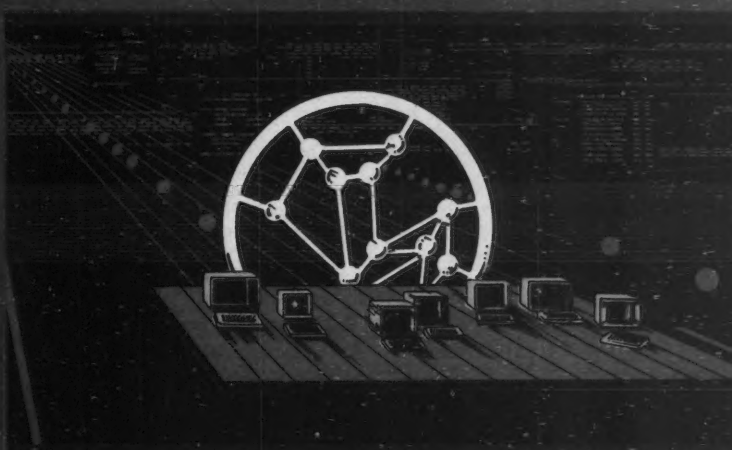
The division will use 1.25-micron line widths and processing methods similar to those Honeywell developed for the Department of Defense's Very High-Speed Integrated Circuit Phase I program, according to a Honeywell spokesman.

Honeywell said that the firm's very large-scale integration manufacturing facility, currently under construction here, will build prototype arrays, design a high-pin-count package and manufacture production units.

The product will eventually be made available to the general market, the company said.

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## COMPUTER INDUSTRY

# By releasing incompatible software products, IBM

By Paul Korzenowski  
CW Staff

As microcomputer software developers attempt to determine which operating environment to write for, they face a perplexing number of choices.

"Software developers are confused," Jacob Geller, chairman of Fox & Geller, Inc., an Elmwood Park, N.J., vendor, claimed. "It just isn't clear where the market is heading."

Much of the confusion stems from contradictory messages emanating from IBM's Boca Raton, Fla., facilities. Last month, IBM announced Topview, a window management program that seemed destined to emerge as the principal windowing system for the IBM Personal Computer. Earlier this month, IBM released graph-

printers and plotters. VDI can be stored on an operating system diskette. When the user first boots the operating system, he also loads device-driver software. Before he runs a graphics program, the user types in his micro configuration, for example an IBM Personal Computer with a color graphics board and a two-pen plotter. Device-driv-

er software notes the user's configuration. Whenever an application program requires the board or the plotter, it calls VDI, which drives the user's devices.

VDI benefits software developers and users, according to Jan Lewis, senior analyst in microsystems at Infocorp, a Cupertino, Calif., market research firm. The

developer no longer has to tailor a program for every graphics card or printer, he asserted. "VDI will do for graphics what DOS did for disk drives. Before DOS, application developers had to write to disk drive controllers. Now, they can write programs without worrying about which controller the hardware has."

A user no longer has to buy specific output mechanisms to run a program. "Not all programs support all printers," Clarkson said. "Many times a user is unable to use his printer with a program. He either has to buy a printer that works with the software or wait for the software company to support his printer."

*'Historically, [IBM] announces a lot of products. . . . Often, the products do not work with one another.'*

—Dan Bricklin,  
Software Arts, Inc.

ics products for the Personal Computer, many of which do not run under Topview.

Why announce incompatible packages? "IBM tries to cover all bases," stated Dan Bricklin, chairman of Software Arts, Inc., a software company based in Wellesley, Mass. "Historically, they simply announce a lot of products. If a user wants a network, IBM offers a network. If he wants a windowing system, IBM will sell him a windowing system. Often, the products do not work with one another."

Personal Computer users had complained about the product's limited graphics, so IBM introduced a bevy of graphics products. The focal point of the introductions was Virtual Device Interface (VDI), a set of graphics tools that reportedly allow software developers to write one graphics package that can be used with a number of I/O devices. "With VDI, a graphics program produces pictures with the maximum resolution of whatever graphics card the user possesses," claimed Thomas B. Clarkson III, president of Graphic Software Systems, Inc., the company that wrote VDI.

VDI is device-driver software, a term that refers to software that controls devices such as graphics boards, screen displays,

Getting a group of five or six personal computers networked isn't that big a deal. But it gets complicated when the group gets bigger. And in case you hadn't noticed, the groups are getting bigger. Fast.

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# In heavy ne high performan

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## COMPUTER INDUSTRY

## triggers confusion among developers

While Clarkson claims that VDI eliminates the problem of device dependence, it has limitations. There has to be a device driver written for the user's printer, and the application software has to support VDI. Clarkson claimed that approximately 30 VDI device drivers have been written, and 10 packages support VDI.

Opponents of VDI point out that, theoretically, operating systems provide portability for application developers, yet most programs work on only one microcomputer. Developers bypassed the VDI's operating system, claiming it worked slowly. "It made sense for a vendor to write to the hardware with [Microsoft Corp.] MS-

DOS," Clarkson claimed. "It was limited. I doubt that many programs write to the [Apple Computer, Inc.] Macintosh. They use the [Macintosh's] Quickdraw facilities. Similarly, I don't think that developers will gain anything by bypassing VDI."

Despite VDI's benefits, IBM stated that Topview does not support VDI, nor

does IBM plan to make the two products compatible.

Because of IBM's perceived wavering, some software companies may be slow to adopt either Topview or VDI. "There were a number of companies who followed IBM when it announced [PCjr]," Bricklin noted. "Many of those companies are not in business today."

## Tandem to target airlines

CUPERTINO, Calif. — Tandem Computer, Inc. has recently announced joint ventures to develop an airline reservations system and to market a number of application software packages for the airline industry.

Partners in the ventures are Bedford Associates, Inc., a Norwalk, Conn.-based software company; Linjeflyg AB, a subsidiary of the Scandinavian Airlines Systems Group (SAS); and Scanator AB, a software marketing and management consulting concern jointly owned by SAS and Enator AB, an international consulting firm.

The reservation system, Spar, was designed by Linjeflyg and will be operational in December 1985, Tandem said. Bedford will develop a standard version of the Spar system, which will be marketed in North America by Bedford and Tandem and in the rest of the world by Tandem and Scanator.

Larry McGraw, Tandem's vice-president of marketing and service support, said the airline industry has indicated a need for Tandem's fault-tolerant, on-line transaction processing in their DP strategies. "The major airlines see a need to offload their existing systems, most of which were designed in the '60s," he added.

## Honeywell to market Stratus line

WASHINGTON, D.C. — Stratus Computer, Inc. announced recently that Honeywell, Inc.'s Federal Systems Division will market the Stratus line of fault-tolerant systems to the federal government.

Under the terms of a cooperative sales agreement signed by the two companies, Honeywell will act as Stratus' exclusive sales agent for General Service Administration schedule contract business on a nationwide basis.

Stratus President William E. Foster said Honeywell has proven marketing resources and experience serving federal customers.

The agreement, Foster pointed out, does not preclude Stratus from bidding on competitive government procurements as a prime contractor or from working with other vendors as a subcontractor.

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## COMPUTER INDUSTRY

## Computervision ends patent suit, pays PE \$18 million

BEDFORD, Mass. — Computervision Corp. recently agreed to pay Perkin-Elmer Corp., a Norwalk, Conn., diversified manufacturer, \$18 million in an out-of-court settlement of a seven-year-old patent infringement suit.

The lawsuit, which was originally brought by PE in 1977, charged that the former Cobilt Division of Computervision applied proprietary PE technology in the design of its CA3000 semiconductor alignment system. The suit accused the Cobilt Division (which Computervision sold in 1981) of infringing on two patents, both protecting the optics system of PE's Microalign projection mask aligner.

The U.S. Court of Appeals in San Francisco had overturned a lower court jury ruling in 1979 that the PE patents were valid, but that Computervision's CA3000 did not infringe on those patents. The case was returned to the lower court for a trial

in which PE was claiming \$40 million in damages.

Computervision had appealed the case to the U.S. Supreme Court, challenging the appellate court's right to overturn the original jury verdict, according to Richard Krieger, a Computervision spokesman. The high court had not yet decided whether to hear the case.

Computervision, a manufacturer of computer-aided design and manufacturing equipment, said the suit cost the company hundreds of thousands of dollars in legal fees.

Krieger said the company was not acknowledging infringement, but was instead recognizing that "the courts certainly believe that an in-

fringement occurred."

The two companies said they have terminated all litigation involving the suit.

Krieger said part of the settlement will be reported in the third quarter as a \$6.5 million, or 23 cents per share, charge against discontinued operations. The actual amount to be charged at the end of the third quarter is

\$13 million, he noted, but the amount will be reduced 50% by being treated as a tax-deductible expense.

In the second quarter, which ended June 30, Computervision charged \$7 million to discontinued operations of the Cobilt Division, including \$5 million for costs stemming from claims involving the lawsuit.

3 2 7 0 S T R

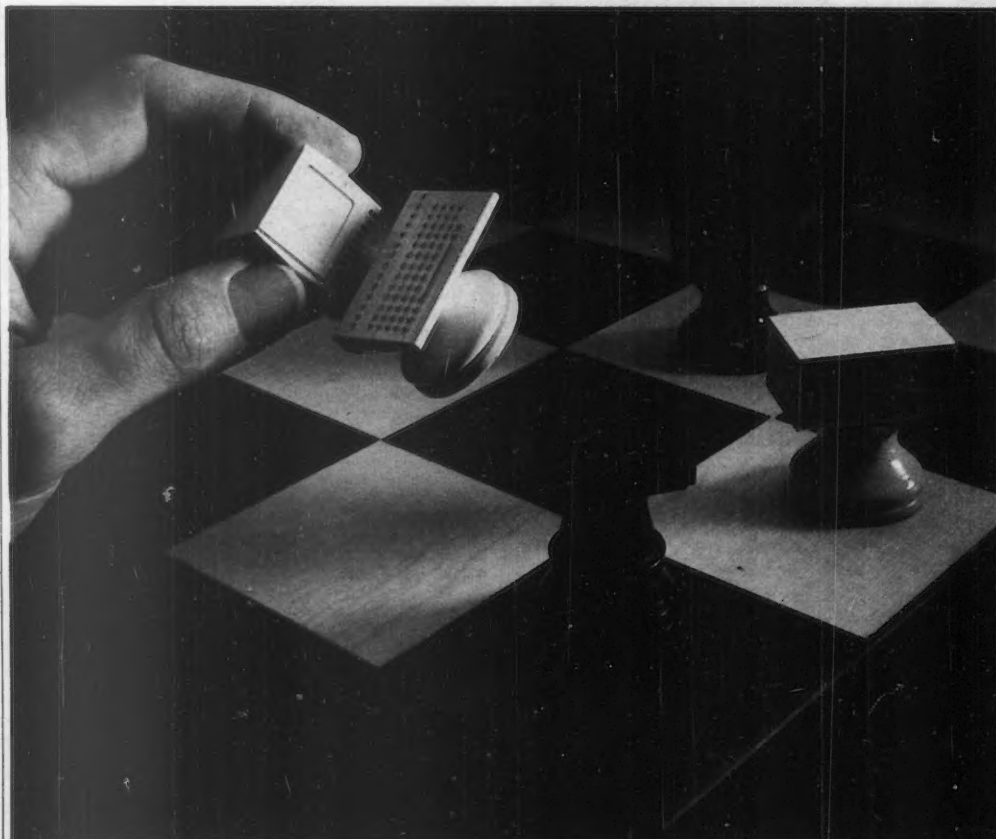
You have to think  
ahead a few moves to win  
the network game.

## Lotus settles 1-2-3 lawsuit

CAMBRIDGE, Mass. — Lotus Development Corp. recently announced the settlement of the \$1 million lawsuit it filed in July against Health Group, Inc. that stemmed from allegations that Health Group had made unauthorized copies of Lotus' 1-2-3 software program.

Under the terms of the settlement, Health Group consented to entry of a consent decree prohibiting it from making or using unauthorized copies of 1-2-3 and related materials. Health Group also agreed to pay Lotus an undisclosed amount.

Lotus said Health Group took steps to end unauthorized copying carried out by lower level employees without the knowledge of management. Lotus said Health Group terminated the employees involved and destroyed all unauthorized copies of 1-2-3.



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## COMPUTER INDUSTRY

## UK's Thorn EMI moves to acquire EPS

WINDHAM, N.H. — Thorn EMI Information Technology of Great Britain recently agreed in principle to acquire Evaluation and Planning Systems, Inc. (EPS), a supplier of decision support systems based here.

Details of the acquisition were not announced pending completion of the agreement.

Chris Carter, president of EPS, said he was delighted by the agreement and was confident that the company's \$2.6 million profit for the year ended in March "will be greatly enhanced by marketing our products in conjunction with Thorn EMI's existing complementary range of business-oriented software tools."

Thorn EMI is a conglomerate with worldwide revenues of \$4.4 billion. Its revenues come from products in the areas of information technology, electronics and engineering, consumer electronics, music and screen entertainment and other interests.

According to an EPS spokesman, the combination of the EPS firm and Thorn EMI Computer Software would produce revenues of \$40 million and would consist of a staff of 400 employees.

Thorn EMI Computer Software is part of Thorn EMI Information Technologies, a company with annual revenues in excess of \$325 million.

## Satellite partnership initiated

WASHINGTON, D.C. — Communications Satellite Corp. (Comsat) recently announced it had reached a preliminary agreement under which Prudential Insurance Co. of America and Douglas F. Ruhe, co-owner of United Press International, would form a broadcast satellite partnership.

Under terms of the agreement, the partnership would provide direct broadcast satellite television services using small receiving antennae. Comsat would initially own approximately half of the partnership, which would be capitalized through both equity and debt.

The agreement also stipulates that the business of United Satellite Communications, Inc., in which Prudential has a 51.9% investment, would be combined with Satellite Television Corp., a Comsat subsidiary. Both businesses would be run by the partnership.

The venture would eventually use satellites under manufacture by RCA Astro-Electronics for Satellite Television. In the meantime, the partnership would provide a subscription television service.

The transaction is subject to negotiation of a definitive agreement and final approval by all parties.

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## COMPUTER INDUSTRY

## Bank to offer DP services

LOS ANGELES — Security Pacific National Bank announced recently that its internal operations and information services organization has been established as a new division that will do business as Security Pacific Automation Co.

The newly formed division will offer an extensive array of data processing and telecommunications services to customers, according to the bank.

The unit has a staff of 3,700 people in offices around the world and a revenue base in excess of \$200 million, including revenues related to building, designing, operating and maintaining the technology-based services for the bank's domestic and

international activities.

DuWayne J. Peterson, executive vice-president of Security Pacific National Bank's ADP Group, will be chairman and chief executive officer of the new company; and John P. Singleton, senior vice-president of the bank, will be president and chief operating officer of the data processing company.

"We have an organization that possesses the many specialized skills and expertise required to compete [successfully] in the fast-growing and dynamic information services business," Peterson said. "This step will provide the framework and the flexibility necessary to participate in this exciting marketplace."

## Data Access to reorganize

BLACKWOOD, N.J. — Data Access Systems, Inc. recently announced that, subject to the filing of any appeals, the U.S. District Court in New Jersey had confirmed the company's plan of reorganization under the Federal Bankruptcy Act.

If no appeal is filed, or if an appeal is filed and dismissed, the plan was expected to be consummated on or about Sept. 29, according to Data Access.

Data Access, a distributor of personal computers, terminals and peripherals, will pay approximately \$35 million in a combination of cash, installment notes and redeemable preferred stock. Additionally, creditors will receive two million shares of a

new common stock and a series of warrants to purchase up to 400,000 additional shares. Existing shareholders and certain class action claimants will each, as a class, receive 200,000 shares of common stock and a series of warrants, the company said.

Data Access also announced recently that Dr. Robert G. Scanlon had been named vice-chairman of the board and executive vice-president of the company.

Scanlon was previously executive assistant to the president of Temple University in Philadelphia and prior to that had served four years as secretary of education for the commonwealth of Pennsylvania.

## Sperry forms chairman office, restructures

NEW YORK — Sperry Corp. announced the forming of a new office of the chairman and a reorganization of its electronic systems operation.

Joseph J. Kroger, formerly group vice-president of information systems, was named president of the information systems group, promoted to corporate executive vice-president and elected to the board of directors.

Gerald G. Probst, chairman and chief executive officer, announced the new office of the chairman will include Kroger, Vincent R. McLean, executive vice-president and chief financial officer, and Abner B. Martin, senior vice-president of defense and aerospace.

The reorganization will replace three of Sperry's four divisions — computer systems, electronic systems and flight systems — with three new divisions called information systems, systems management and the defense products and aerospace and marine groups.

Sperry said the reorganization will consolidate operations and delegate more authority to each of its division.

## Miniscribe cuts work force

LONGMONT, Colo. — Disk drive manufacturer Miniscribe Corp. recently announced a work force reduction of about 26% of its 2,000 employees, citing an industrywide slowdown in disk drive sales and the need to reduce operating costs.

Miniscribe announced earlier it expected to incur a third-quarter loss.

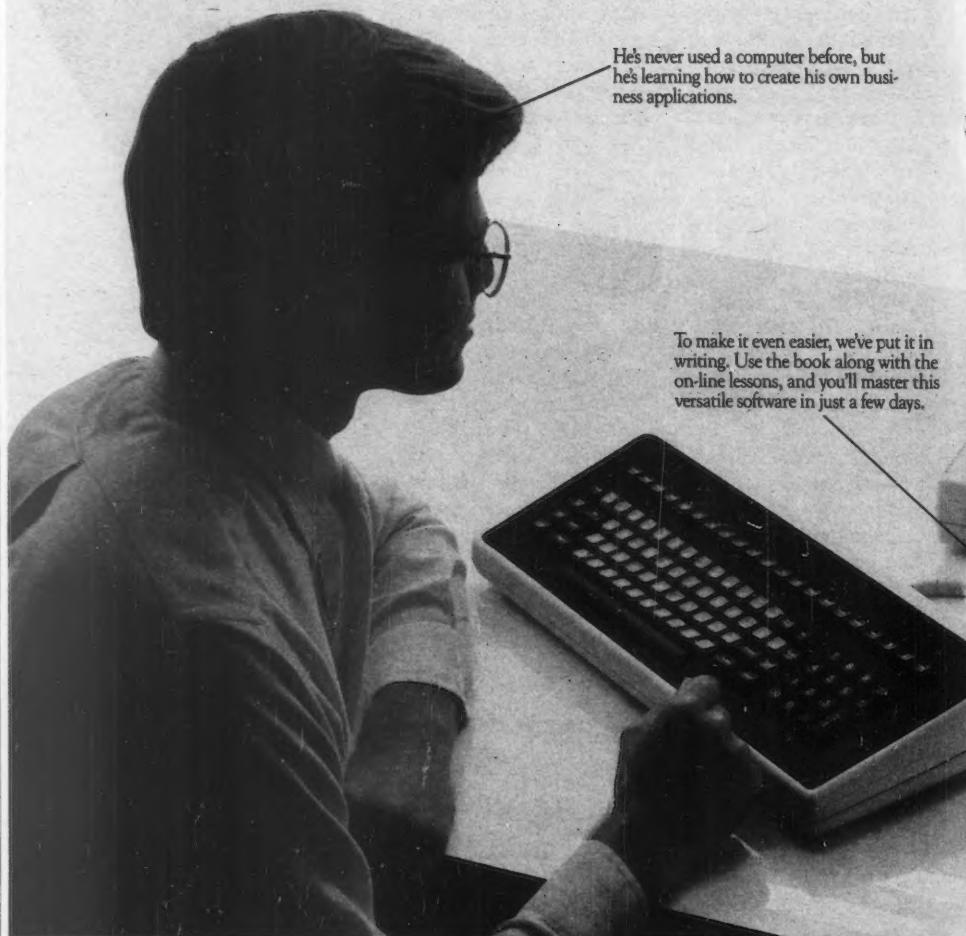
Terry Johnson, Miniscribe president, said the reductions affected 530 employees, about half of whom had been working for the company on a temporary basis.

Johnson said the market for disk drives is in a transition to a higher level of technology and expressed confidence in the firm's products developed to meet that higher level.

If you think big computers are hard to use, this will teach you a lesson.

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## COMPUTER INDUSTRY

## AEA reports trade deficit for 1983 telecom industry

PALO ALTO, Calif. — U.S. imports of telecommunications products exceeded exports in 1983, producing the first negative trade balance in five years, the American Electronics Association (AEA) reported recently.

AEA estimates, derived from U.S. Census Bureau publications, reported exports of telecommunications products from the U.S. rose \$87 million in 1983 to \$1.54 billion. Imports, however, jumped by \$834 million to \$1.94 billion, producing a trade deficit balance of \$400 million, compared to a trade surplus of \$347 million the previous year.

Ralph Thomson, AEA senior vice-

president, said, "We attribute at least a portion of this reversal to the fact that major foreign markets in other countries are generally closed to U.S. telecommunications exporters."

Also contributing to the deficit, Thomson said, were increased competition by overseas competitors in the U.S. open markets, and the continuing strength abroad of the U.S. dollar.

The AEA previously reported that the balance of trade surplus for electronics products overall was reduced to \$100 million in 1983 and is expected to become a deficit in 1984.



### EXECUTIVE CORNER

**Bobby Smith** has replaced **Su Huang** as president of the San Jose, Calif., thin-film head manufacturing firm of **Magnex Corp.**

**Wilfred G. Sardelli** has been appointed president of the systems group of **System Development Corp.**, a **Burroughs Corp.** company.

**Neal J. Robinson** will resign as president of **U.S. Telephone, Inc.**, a subsidiary of **United Telecom Communications, Inc.**, to pursue new business ventures.

**Vaemond Crane** has resigned as

president/chief operating officer and as a director of **Computer Consoles, Inc.**

**Thomas Bond** was named president of **Micro-MRP, Inc.** of **Foster City, Calif.**

**Patrick Welch** has joined **Imagen Corp.** as president and chief executive officer.

**Hiram T. French** has been named president and chief operating officer of **Cadware Group Ltd.**

**Henry C. Montgomery** has been appointed president and chief operating officer, **Trilogy Ltd.**; **Paul McEnroe** has been appointed president and chief operating officer of **Trilogy Systems Corp.**; and **J. K. Dutton** was named director of **Trilogy Ltd.**

**Patrick Courtin** has been named vice-president of technology at **TIE/Communications, Inc.**

**Genicom Corp.** has announced two additions to its management team: **Dennie J. Shadrick**, formerly of **Texas Instruments, Inc.**, has joined as vice-president of engineering and **Robert B. Chapman**, formerly of **Datapoint Corp.**, has been named treasurer.

**Paradyne Corp.** has announced the following promotions: **Blayne E. Maring**, vice-president of network systems development, and **J. Robert Brown**, director of product development planning.

**Chayim Herzog-Marx** has been promoted to vice-president, application products, at **Chase Decision Systems.**

**David R. Holmes**, formerly vice-president and general manager at **Nabisco Brands, Inc.**, has been named group vice-president of **Reynolds & Reynolds'** computer systems group.

**Laszlo Belady** will become vice-president and program director of **Microelectronics and Computer Technology Corp.**'s software technology program.

**Joseph P. Campaniello** has joined **Nashua, N.H.-based BKW, Inc.** as vice-president of conversion services.

**David L. Nettleton** has been appointed executive vice-president for **Decision Data Computer Corp.**

**Edwin Chow** has been named vice-president, product management, at **Synertek, Inc.**, a subsidiary of **Honeywell, Inc.**

**Kenneth K. Larsen** has been promoted to managing director of **Western Digital Corp.**'s new **UK sales subsidiary.**

**Lee Data Corp.** has announced the following promotions: **Bradley A. Adams**, director of lease base management; **E. Michael DiPaolo** has joined as director, software engineering; and **Michel R. Halbouty** was named director, manufacturing support.

**Richard Streller** has been elected chairman of the board of **Hogan Systems, Inc.**

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## COMPUTER INDUSTRY



**Information Solutions, Inc.** posted a net loss of \$239,002, or 13 cents per share, on net sales of \$2.6 million for the third quarter ended July 31.

This compares with net earnings of \$71,954, or 6 cents per share, on net sales of \$2.7 million for the third

quarter one year ago.

**3Com Corp.** reported revenues for the first fiscal quarter ended August 31 rose to \$8.9 million, a 302% increase compared with \$2.2 million in the comparable quarter last year.

Profits were \$1.1 million, or 9 cents per share, compared with \$246,000, or 2 cents per share, in the same period one year earlier.

**SCI Systems, Inc.** reported

ed year-end revenues of \$437.4 million, compared with \$182.5 million one year earlier.

Profits were \$11.5 million, or 91 cents per share, compared with \$6.6 million, or 57 cents per share, for fiscal year 1983.

**Softech, Inc.** announced revenues for the first quarter of \$7.9 million, compared with \$9.5 million for the same period last year. The company reported a loss of

\$346,901, or 10 cents per share, compared with a year-earlier profit of \$515,000, or 14 cents per share.

**Systematics, Inc.** reported profits for the first quarter ended August 31 of \$1.5 million, or 14 cents per share, compared with \$1.6 million, or 15 cents per share, in the same period last year. Revenues were \$21.8 million, compared with \$19 million in the year-earlier quarter.

**Transnet Corp.** announced revenues for the fiscal year ended June 30 of \$14.7 million, compared with \$13.1 million for the same period one year earlier. Profits were \$2 million, or 39 cents per share, compared with \$1.5 million, or 40 cents per share, in the comparable period one year ago.

**Applied Circuit Technology, Inc.** reported a net loss of \$692,485, or 7 cents per share, on revenues of \$1.6 million for the third quarter ended July 31. This compares with profits of \$431,582, or 5 cents per share, on revenues of \$3.5 million during the corresponding period a year ago.

**Ashton-Tate** announced revenues for the third quarter ended July 31 of \$19.1 million, compared with \$11.2 million in the corresponding period one year earlier. Profits were \$682,000, or 7 cents per share, compared with \$149,000, or 2 cents per share, in the same period one year earlier.



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## Solid dollar to cut DP sales abroad

LEXINGTON, Mass. — Next year will be a "good, if not exciting, year," with 3% growth in the gross national product, a government economist told a gathering of chief financial officers from Boston-area high-technology firms at a meeting here sponsored by the American Electronics Association late last month.

On the international scene, the U.S. dollar will continue to remain strong next year, hampering the efforts of American firms to sell in foreign markets, according to economist Richard Kopcke, who is with the Boston branch of the Federal Reserve Bank.

For high-tech firms, this means "you're better off selling into the U.S. market," he maintained.

For these firms, Kopcke cautioned, the trick is to remain on the forefront of technology, rather than to settle back and say "We've spent a lot on what we've got; let's milk it," as he claimed both the U.S. steel and auto industries have done before.

Kopcke also said he is not "terribly worried about the [federal] deficit in 1985." The deficit, which he said currently totals \$200 billion, would not justify a tax hike unless its growth were to break the 5% mark next year, he claimed. That, he said, is unlikely.

## COMPUTER INDUSTRY

**IBM** from page 123

role. The befuddled dwarfs still trying to compete in the mainframe business all fall in the range of \$6 billion; the premiere "youngster," Digital Equipment Corp., falls right in the same category.

**Rolm price tag**

The interest that IBM reportedly will earn on its cash and liquid assets this year alone, in excess of \$1 billion, is almost enough to pay for Rolm's \$1.3 billion price tag. For any other company to dish out \$1 billion is inconceivable. Except for AT&T.

AT&T, if it really sees itself lined up against IBM, as a whole industry of analysts and consultants see it,

really needs to do something in a hurry to maintain credibility. An established superminicomputer vendor and sales network would add a little muscle to the wimpy challenge represented by the AT&T 3B line of computers.

If AT&T does not act, either through acquisition or rapid rollout of new-generation products, where does that leave the computer marketplace?

Despite Akers' denials, it would leave the computer business with a massive concentration of power in certain key segments — perhaps a more massive concentration than that held by the early 20th century oil giants, which spurred the concept of antitrust regulation.

IBM holds 70% of the mainframe

market and is likely to grab more with its next-generation Sierra line. It reportedly — IBM itself will never say — earns about \$5 billion or so in sales of software; think of the big independents in software — Management Science America, Inc., Culinet Software, Inc., Informatics General Corp. and a handful of others — and together they amount to little more than gnats buzzing around the giant's head.

It seems highly unlikely that the present administration will raise any obstacles to the IBM/Rolm deal. But you have to wonder how much further this situation can go.

**Control major part**

If AT&T fades and IBM moves solidly into the telecommunications

field, IBM will control a massive amount of the marketplace. Maybe there will be a few superminicomputer vendors on its flanks and a few micro vendors eating scraps at its feet, but IBM will have sewn up the lion's share of the information processing and communications resources of the major part of U.S. business.

In that situation, good intentions or not, IBM, just by size alone, will present a damper to free enterprise and real competition.

The champion of free enterprise, President Reagan, may not have any problem with that.

But some future administration is going to rule that excessive concentration of power is contrary to U.S. law.

**LOSS** from page 123

petitive marketplace."

The company's efforts, Deleage said, "are mainly directed to reorganizing operations and improving its product offerings and financial position through a possible merger or acquisition."

An early leader in sales of microcomputers, Vector Graphics suffered financial setbacks when IBM's success with its Personal Computer added new dynamics to the marketplace.

**DEC** from page 123

market of BCG — companies with annual revenues from \$100,000 to \$100 million — will spend \$8 billion on computer equipment during the period from mid-1984 to mid-1985, up from \$6.5 billion for the same period the year before.

In surveys of executives representing that market, MacKenzie said, DEC has determined that small businesses have no vendor preference and are mostly concerned about the vendors' understanding of the particular vertical markets and the ability to meet the needs of businessmen in those markets. Additionally, MacKenzie said, only 16% of that market has been penetrated by computer vendors.

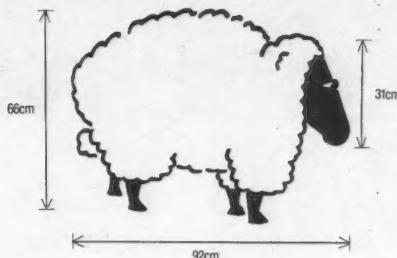
**Market solutions**

To reach that market, BCG will offer "solutions" based around equipment ranging from DEC's Rainbow microcomputer to PDP-11 minicomputers to VAX-11 superminicomputers. "We are not unknown in that market," MacKenzie asserted. "There are thousands and thousands of PDP-11s and VAX-11s out there ... and over 2,000 application packages available on PDP-11s," MacKenzie said.

To bring its "solution" message to small businesses, BCG has unveiled a market mapping program to coordinate the efforts of OEMs, dealers, retailers and Digital Business Centers in geographic regions around the country. Appointed U.S. Distribution Sales Group manager to head up that effort was Jay H. Atlas, formerly Field Service Business Group manager.

O'Keefe said the mapping program was instituted to implement sales and service strategies in each geographic area.

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## COMPUTER INDUSTRY



## SUPERSHORTS

**Northern Telecom, Inc.** announced that its telephone manufacturing division in Nashville has been renamed **Advanced Communications Terminals**. W. R. Moore, vice-president, terminals, has been appointed head of the new division, which is part of the company's integrated office systems operating group and will now manufacture, market and service a complete line of voice and data terminal equipment.

**Apollo Computer, Inc.** will open a \$2.54 million facility in Livingston, Scotland. The 34,000-sq-ft facility will house training, sales and service

and a pan-European logistics repair outlet. In the long run, the company said it intends to set up a manufacturing center.

**American Satellite Co.** announced the signing of a multi-million-dollar contract with **Sears Communications Co.**, a subsidiary of Sears, Roebuck and Co., for a private voice, data and video teleconferencing network. The network will connect Sears corporate and subsidiary offices in 26 U.S. cities, making it the largest private satellite network in existence for full-motion video teleconferencing.

**Informatics General Corp.** announced the signing of a joint venture agreement with **Axelrod N.V.** to form **International Health Information Applications (IHIA)**. IHIA will

offer electronic access to health care information to a variety of users.

**Shugart Corp.** has expanded its domestic distribution sales network with the addition of **Wyle Laboratories** as a distributor of its floppy and Winchester disk drives.

**Canton Automated Systems, Inc. (CAS)**, a supplier of data processing services, has opened a data center in Kansas City, Kan. CAS Kansas is located in Brookhollow Office/Industrial Park in Johnson County.

**The Du Pont Co. and Intel Corp.** announced their support for the development of a nonproprietary manufacturing automation protocol (MAP) standard for data communications networks to expedite factory-floor exchange of information be-

tween computers and computer-controlled equipment. Intel also announced its commitment to a broad range of products designed to assist industry efforts toward factory automation. MAP is the set of baseline standards developed to guide companies in supplying products for use in connecting automated operations in General Motors Corp. plants.

**Systems Strategies, Inc.** announced the formation of **Portable Software, Inc. (PSI)**, a wholly owned N.Y.-based subsidiary. PSI develops and markets portable, C language software communications packages that enable non-IBM hardware to emulate IBM peripheral devices, as well as a package that interfaces to CCITT's X.25 communications protocol.

**The Ultimate Corp.** announced the formation of a public-sector division to market solution-oriented software to municipal governments and other public authorities.

**Applied Data Research, Inc.**, founded 25 years ago, reported that the company's stock is trading on the New York Stock Exchange. The new ticker symbol is ADR.

**Martin Marietta Data Systems, Inc.** has formed two divisions to strengthen its position in the development and marketing of computer software and its growing role as an integrator of complete systems for data management. A new information technology division combines four existing units that develop and market software and related services for commercial markets. The systems integration division will concentrate on DP systems for facility management in government agencies and for health and educational institutions.

In a move to help expand its dealer network in the U.S., **Burroughs Corp.** has adopted a new microcomputer dealer agreement that has been approved by the National Office Machine Dealers Association.

The Burroughs microcomputer dealer agreement provides for: mutually agreed upon product quotas; an open-ended term of agreement, contingent upon the timely payment of bills and achievement of established quotas; and resolution of certain disputes through an independent arbitrator.

**Fujitsu America, Inc.** has selected the Portland, Ore. area as the site for its new magnetic disk drive manufacturing facility. The disk plant, utilizing Fujitsu's highly automated manufacturing systems, will hire some 500 employees over the next three years. The plant is slated to start production in late 1985.

**AM International, Inc.** reported that U.S. bankruptcy Judge Lawrence Fisher entered an order confirming the company's plan of reorganization. AM International, which has been operating under Chapter 11 of the Federal Bankruptcy Act since April 14, 1982, said it expects cash and common stock distributions, as stipulated under the plan, will commence within the next 30 to 60 days, provided that the level of allowed and disputed unsecured claims, excluding the disputed claim of one creditor in the amount of \$111.5 million, do not exceed \$275 million.

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Nancy Squires  
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North Bethesda, MD 20895  
(301) 231-7850

### Midwest

Lori Holden  
Arbor Terrace II  
205 Bishops Way  
Suite 206  
Brookfield, WI 53005  
(414) 784-9337

Steve Grunkemeyer  
1011 East Touhy Avenue  
Des Plaines, IL 60018  
(312) 296-9660

Leah Fischer  
7300 France Avenue South  
Edina, MN 55435  
(612) 835-7779

### Southwest

Randy Techman  
5757 Alpha Road  
Dallas, TX 75240  
(214) 385-3290

Phyllis Erickson  
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Suite 560  
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## Corporate Headquarters

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#### SYSTEMS ANALYST

Degree in computer science or Business Admin., or equiv. work-related exp. in Systems/Program Development in large-scale computer. Successful candidate should also have good supervisory and communication skills. Salary from \$29,000 to \$39,500 depending on qualifications.

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Desired Background: database, on-line applications, Burroughs hardware, telecommunications, 3+ yrs. experience programming/systems analysis.

#### Salary:

\$20s - depending upon experience

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Deadline for application:  
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#### FACULTY POSITION

Purdue University Statewide Technology Program at Columbus

An opening in the Computer Technology Department in the Purdue University Statewide Technology Program offered in Columbus is available January 1, 1985. The Statewide Technology Program in Columbus is administered through the Purdue School of Engineering and Technology at Indiana University-Purdue University at Indianapolis (IUPUI).

Applicants should have a strong background in IBM hardware, COBOL, and the interest and ability to teach in a commercially oriented degree program. Business or industry experience, teaching experience, and a master's degree in the field or related field are preferred. Salary commensurate with experience.

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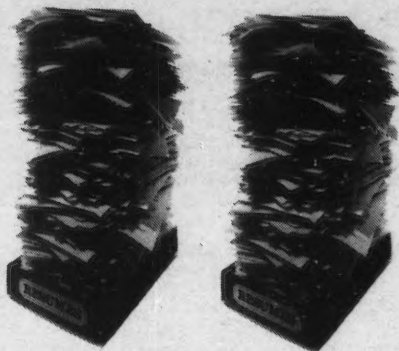
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**Software Specialists** BS/CS (MS), Math or EE with 5+ years experience using IBM mainframes with fluency in FORTRAN, Assembly, Pascal and/or PL-1 languages.

**Senior Training Specialist/Programmer** 2 or more years experience in instructing technical subjects. Experience as semiconductor applications and/or test engineer and experience with higher level programming languages (FORTRAN, Pascal or FORTRAN or VAX/VMS) highly desirable. Will teach the operation and programming of product lines to users.

**ATE-VLSI-LSI Engineers** BS and 2+ years experience. Opportunities in electronics/semiconductor & CAD/CAM industries.

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**Electronics Engineers/Telecommunications Software** Leaders in the data communications industry. Requires experience in real time applications, telecommunications peripheral industry, BSEE or CS. DEC VAX or MINI, UNIX, ASSEMBLER, C, Communications software proficiency.

**Software Engineers - Guidance Systems** Real-time communications software design test, configuration management, array processors, resistor transfer languages and VHSC. BS/CS or EE, minimum of 2 years experience. T/TA, PASCAL, C, ADA, ASSEMBLER mini experience.

**CAD Engineering or System Design** Software experience, FORTRAN, C, BSEE/MSEE or equal, 2 years industry experience. UNIX a +. VMI/CMS plus UNIX in IBM, DEC environment. Database design. Knowledge of solid state devices, digital and analog IC's. BSEE or equal experience in ASSEMBLER, UNIX, C desired. Experience testing to wafer level microwave a plus.

**Electronics Engineers** BS EE or CS. Systems design experience in Hardware, Firmware or Software, UNIX, C and ASSEMBLY are a +.

**Internal DP Consultants** Minimum 3-5 years DP experience. Bachelor's degree and excellent communication/interpersonal skills are essential. Project management and software design experience desirable. Knowledge of any of the following areas highly desirable: COBOL, CICS, PL/1, FOCUS, and IMS.

**Technical Programmer** Support Network Control, activate and monitor on-line performance, circuit and equipment operation and supervise operators on a large network. Prefer 2 years experience operating a large network, knowledge of VTAM, CICS, 3705's, NCGE, NPDA and problem diagnosis/resolution. TSO and JCL a plus.

**Technical Specialists** Data base, data communications, telecommunications, mini, micro, systems software and application software technical skills required. Degree in Computer Science or Engineering and good interpersonal skills necessary.

**Sr. Programmer Analyst** Must have at least 3 years of BAL experience using IBM hardware in an OS environment. Heavy user contact.

**Senior Technical Consultants** Lead the design, development, testing and implementation of human resources, payroll and accounting products. Requirements: MICRODATA/PICK OS. HRIS, personnel, payroll, accounting applications a plus.

**Circuit Design Engineer** CMOS ICs including advanced CMOS gate arrays, +5 yrs. exp. BSEE.

**Microvare Integrated Circuit Design Engineers** BS with 3+ years experience in the design of microwave couplers, filters, and switches in microstrip and/or suspended substrate media.

**Applications Engineer** BSEE/CS (MSEE desired), and 3-8 years experience with semiconductor devices in 1 or more of the following: Test Engineering, Field Applications, Engineering Applications, Technical Marketing. Will provide applications support of Marketing and Field Operations activities.

**Computer Service Sales** Initiate the introduction of new micro 8 mini based systems products and services. Requirements: 3 years commissioned sales experience in data processing systems/services or hardware; payroll, accounting, human resources product experience.

**Programmer Analysts** Programming, analysis, design of a variety of business applications. IMS DB/DC, or IDMS, or CICS required. Some system methodology experience.

**Software Specialists** BS/CS (MS), EE and 5+ years experience in large systems networking, mid management with CPCL experience in communications environment; proficiency in FORTRAN and PASCAL; image processing background a +.

**Programmer Analysts** Challenging applications in accounting, finance, distribution, inventory management — 2 years MICRODATA or PICK OS experience with DB 6 a plus.

**Programmers** Variety of applications across all disciplines. Requires 2 years MACRO PDP11 and ASSEMBLER experience.

**Digital Circuit Design Engineers** Design, breadboard, and test advanced signal processors for radar, acoustic processing and MIL-SPEC applications. MSEE and four + years of experience.

**Telecommunications Consultants** Design and develop a telecommunications network to support the nationwide delivery of data processing and information services products. Five + years of experience in multi-phase telecommunication design and development. Knowledge of mini and micro computers desirable. Ability to consider business needs in multi design objectives. Marketing experience a +.

**Systems Consultants - IBM SYS/34** Serve as Team Leader on multiple projects. Operations and product management in product definition and user requirements, research through implementation. Requirements: IBM SYS/34, RPG II, COBOL, CICS, DOS/VSE preferred.

**Senior Technical Consultants** Lead the design, development, testing and implementation of human resources, payroll and accounting products. Requirements: MICRODATA/PICK OS. HRIS, personnel, payroll, accounting applications a plus.

**Senior Technical Consultants - TANDEM** Heavy team environment in analyzing, designing and testing financial applications. Experience with: TANDEM/TAL, COBOL, SCOBOL, Financial Applications.

**Systems/Technical Consultants** Key resource in analyzing, developing and integrating user department systems. Experience with DEC VAX, 11/780, IBM 3030X, HP or similar minis, COBOL. User support experience a +.

**Senior Systems/Technical Consultants** Conduct research within operating departments and product management to identify needs, modifications, interfacing requirements — concept through implementation. Experience in business systems analysis. COBOL, ASSEMBLER, EASYTRIEVE.

**Systems Analysts** Requirements: COBOL, VSAM, TSO, JCL, ASSEMBLER and/or payroll experience a plus.

**Programming Supervisor** BS/CS or related technical disciplines. 5+ years solid systems programming experience in the MVS operating environment. Assembler/MVS. Responsible for the installation and ongoing support for MVS operating system and subsystem program products (VTAM, CICS, JES2, IMS/DB).

**Customer Support Representatives - Computer Services** Provide technical support to customers and marketing. Analyze customer hardware and software, develop alternatives, recommendations and solutions to unique situations. Requirements: one + years in data processing or equivalent education; experience with microcomputer-based solutions +; technical service support. Applications background: payroll/personnel, marketing, accounting/finance.

**Systems Manager** VAX or equivalent. Mini operations experience. Provide direction to users. Build utilities and tools. BS/CS or equivalent. VAX systems manager in UNIX environment. C and ASSEMBLY language code experience.

**Senior Electronics Engineers** Circuit design of computer based logic for tape and disk drive. 3+ years hardware logic design. 1+ years tape/disk experience.

**Engineering Managers** BSEE, 2 years management experience. Mainframe or minicomputer environment design experience.

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**Software Engineers** Positions require a BS/CS or EE and a minimum of 2 years experience. Real-time T/TA software, PASCAL, C, ADA, Jovial and assembly language, Advanced Signal Processing, Parametric definition, time/memory tradeoffs and real-time codes, VAX running VMS procedure development, test systems and real-time communications software, design coding and test of real-time imbedded guidance systems, configuration management, array processors and other target microengines, systems programming including hardware description languages, resistor transfer languages and other CAD tools, development of VHSC hardware descriptor language.

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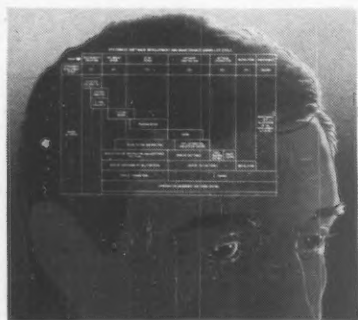
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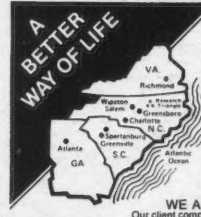
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Data Base environ seeking  
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TECH PROGRAMMER  
DATA BASE

Devel oppty w/IMS DB/DC  
and data dictionary. Gain exp  
w/local DB design, user train-  
ing, test plan devel in a grow-  
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## VM SPEC'S

Suburban NE client seeking  
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to have key tech support  
respons for VM/CMS plan-  
ning, training, support for all  
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Salaries to \$37,000

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Salary to \$34,000

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These positions involve the development and support of systems level software including operating systems, utilities, compilers, graphics libraries, and database management systems. Duties also include design, specification, and acquisition of new computer systems. A degree in Computer Science or Electrical Engineering and 2 years experience with DEC PDP-11 and/or VAX minicomputer systems is required.

### SYSTEMS MANAGERS

These positions involve both technical and administrative support of distributed minicomputer systems. Duties include software development and support, user consultation, equipment and software acquisition, and administrative duties relevant to computer center operations. Positions are available for support of both scientific/engineering and financial/administrative systems. A degree in Computer Science or Business Administration and 2 years experience with DEC VAX minicomputer systems is required.

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This position involves support of datacommunications in a dynamic, distributed computer environment utilizing advanced technologies such as digital PABX, intelligent port selectors, microwave and fiber optic transmission media, and Ethernet local area networks. Duties include design and acquisition of datacommunications systems, troubleshooting, network administration, and communication software development. A degree in Electrical Engineering or equivalent experience is required. Experience with DECnet, Ungermann-Bass Net-One, and mixed DEC/IBM environments is highly desired.

Send resume and salary requirements to: C.J. Mitchell, Employment, Battelle-NW, P.O. Box 999, Richland, WA 99352. U.S. citizenship required. An Equal Opportunity Employer m/f.



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- MIS
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- INFORMATION TECHNOLOGY
- MICRO SOFTWARE DEVELOPMENT

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Primary responsibilities include data base design and administration using DLI, CICS, VSAM. Other duties may include system maintenance of VM, VSE, ACF/NCP, VTAM and non-IBM products such as CA/DYNAM and VOL/LEBRARIAN. Position requires 3-5 years experience on DOS/VSE with at least 1 year DLI design and administration. Salary plus benefit package. Equal Opportunity Employer M/F.

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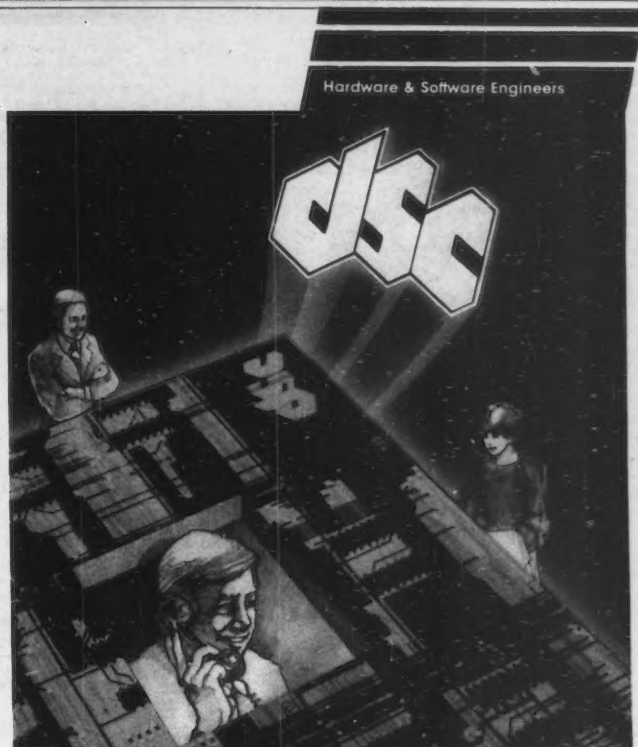
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Design experience should include microprocessor communication interfaces, peripheral controllers and memory systems. Minimum of three years experience designing T1 interfaces, lines or trunks for digital control offices, PABX's or subscriber carrier equipment. Familiarity with Z80, Z8000 or other microprocessors, as well as dynamic Ram components is a must.

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Will be involved in analyzing product system requirements, resolving hardware/software system architecture trade-offs, generating system level specifications for new products and providing enhancement specifications for existing products. Will help to prepare proposals and presentations and be involved in customer interface. Must be aware of the state-of-the-art feature requirements as they apply to telecommunications, with strong background in hardware and software development and systems level design.

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Your duties will include subsystem design, program design, on line coding, data base update and retrieval programs. In addition, you'll also be responsible for high level language reports and the analysis, design, coding and implementation of large scale software development requirements. Requirements include strong technical skills in COBOL and IDMS, experience in high level languages, a BS in Computer Science or its equivalent and 2 years of related experience.

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## SYSTEMS PROGRAMMER

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You should have at least 3 years of experience with IBM CPCS, using COBOL, MVS JCL, VSAM, ASSEMBLER, and IBM utilities. A background in CICS, Easytrieve, SAM, ROSCOE and Kodak fiche processing is helpful. Heavy user contact requires someone with top communication skills.

We can offer a competitive salary and benefit package that includes profit sharing and dental coverage, plus excellent potential for professional advancement. For prompt consideration send your resume in confidence to: Midlantic National Bank - CPCS, 95 Old Short Hills Road, West Orange, NJ 07052 or call June Kelly collect at (201) 266-6492. Equal opportunity employer M/F.

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### Research Programmer - IBM Mainframe Support (Code A-2)

The University of Illinois Computing Services Office has a Research Programmer position (full or part-time) available. System is a 4381 running VM and VLSI. Mainframe attached to several IBM 4341s and accessible from CYBERs and other machines. Programmer will maintain VM and VLSI; add/modify packages; configure disks; establish backup and restore procedures for files and drawings; establish an accounting system; provide functions needed to support College of Engineering research and studies.

Requirements: Experience with IBM operating system; interest in graphics and CAD/CAM support; and ability to communicate effectively.

Starting Date/Salary Range: Flexible - \$20,000-\$40,000. In order to ensure full consideration, applications must be received by October 30, 1984. Send applications to Sandy Moy, University of Illinois, Room 177 DCL, 1304 W. Springfield Ave., Urbana, IL 61801. Phone 217-333-4703.

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# HUGHES

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Technology leader Hughes Aircraft Company's growing Support Systems organization in the suburban oceanside community of Long Beach, California, is seeking your test equipment applications software and training simulation software experience for the following positions:

• **Systems Software Engineers**—A minimum of three years experience is preferred. Areas of interest include knowledge of radar principles and simulation and/or real-time operating systems such as SEL's MPX-32 and DEC's RSX and VMS. Experience with I/O Drivers is a definite plus. We also need people who have successfully performed complex system modeling and analysis activities in the past.

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A career with Hughes includes an excellent benefits package that offers family medical, dental, and vision-care coverage, a tax-deferred savings plan, and more.

Please send your resume to: Lowell Anderson, A1/1B404, Hughes Support Systems, Dept. 054, P.O. Box 9399, Long Beach, CA 90810-0399. Proof of U.S. Citizenship Required. Equal Opportunity Employer.

**HUGHES**  
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## SUPPORT SYSTEMS

### SYSTEMS PROGRAMMER DATA COMMUNICATIONS

The Technical Services group of a large eastern electric utility is looking for an individual with a systems background in data communications. The job will involve the operation and maintenance of an IBM SNA/SDLC network. Some background with products like VTAM, TCAM, NCP, NCCF, and NPDA is desirable. It is also desirable to have had some experience in the integration of micro computer components into a local network and their connection to an IBM mainframe.

A degree in engineering, computer science, or comparable experience in the computer field is required. Salary to \$33K. An excellent benefits package is provided. Please send resume to:

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**Box 880**  
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### FACULTY POSITIONS IN INFORMATION SYSTEMS

Naval Postgraduate School  
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The Administrative Sciences Department of the Naval Postgraduate School has outstanding full-time (tenure track) and visiting faculty positions available at all levels in Information Systems. Opportunities exist for teaching, research and curriculum development in the areas of artificial intelligence, computer networks, database systems, decision support systems, distributed systems, economics of information systems, information systems management, knowledge-based systems, real-time systems, software engineering and management and systems analysis and design. The School has an active program of research in information systems. There are excellent research opportunities for new faculty and a teaching/research load which is compatible with faculty research objectives. Extensive computer facilities are available to support research and instruction, including an IBM 3033 AP under VAX/VMS and MVS, numerous VAX 11/780s running UNIX and VMS, many mini and micro computers and access to the ARPANET. Naval Postgraduate School salaries are nationally competitive. Minimum qualifications are either a Ph.D. or D.B.A. with a major in information systems or a closely related doctoral degree (e.g., accounting, computer science) with some industrial or government experience in information systems. ADEs will be considered if all requirements for the doctorate will be completed by September 1986. Equal Opportunity Employer. Please send resume to: Professor Norman F. Schneidewind, Code 5416, Naval Postgraduate School, Monterey, CA 93943 or call (408) 646-2719 or 646-3211/3212.

### DATA PROCESSING TECHNICAL SERVICES SPECIALIST System/38 Environment

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# SYSTEMS OPENINGS

Prominent worldwide transportation firm, conveniently located in suburban New Jersey (20 minutes from New York City), has exceptional career opportunities for the following Systems Professionals.

## 8100 SYSTEMS SOFTWARE PROGRAMMER

The successful individual will have a knowledge of DPPX-DPPX/SP with 3-5 years experience. Environment includes worldwide distributed IBM 8100 Systems communicating to host facilities using HTF/DSX software. Host environment includes multiple large scale IBM computers operating under VM/SP, MVS/SP and DOS/VSE systems. Experience working with peer to peer would be a plus.

## SENIOR SYSTEMS PROGRAMMER

The ideal candidate will have minimum 5 years experience working with ACF/NCP, VTAM, MSNF in a DOS/VSE or MVS/SP environment. Knowledge of CICS is desired. Primary duties include:

- installation, maintenance & support of above software.
- network performance analysis and tuning.
- 3725 installation and support.

## MVS/SP SENIOR SYSTEMS PROGRAMMER

This talented, creative self-starter should have minimum 5 years experience working with MVS/SP, JES-2 and CICS software with excellent written and oral communication skills. Work environment includes IBM 3031, 3033 and 4341 hardware. Additional duties involve:

- capacity planning • performance analysis • tuning • XA analysis

Qualified individuals interested in a progressive state-of-the-art environment, outstanding starting salaries, participation in an outstanding benefits package including an employee stock purchase program and full relocation, should forward resume along with salary history and requirements with a cover letter or contact immediately:



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The ideal candidate should have both technological and management experience in telecommunications. Specific knowledge to include: state of the art PBX switch technology, local and long-distance network design/analysis, tariff structure and regulation. Excellent interpersonal skills; data communications exposure a plus. Familiarity with cost accounting, financial management and long-range operations plans.

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### Data Processing

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Responsible for installation, maintenance, modification and tuning of systems software, including MVS/SP, JES 2, and numerous vendor packages, for three large mainframes with shared DASD. Requires a minimum of 3 years systems programming experience and knowledge of MVS internals.

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Personnel Department

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These positions offer career growth working in a state of the art environment with more than 150 systems professionals. AAL is the nation's largest fraternal life and health insurance society with over \$25 billion of life insurance in force. It provides 1550 home office employees with modern working conditions in a mid-sized, family oriented community offering excellent recreational and educational facilities.

Send confidential resume to:

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## Senior Systems Programmer

This position requires a Bachelor's Degree in Computer Science or related discipline, or an equivalent combination of education and experience. Extensive systems programming experience involving support of IBM's MVS operating system is required. Experience with CICS and IMS/DB is highly desirable. Knowledge of large-scale IBM computer hardware is also desirable. Responsibilities will include installation and maintenance of purchased software, and maintenance and tuning of system software.

At the University of Iowa Hospitals, you will be working in an up-to-date environment with dual IBM 3081 computers running MVS, CICS, and IMS. You will have your own TSO/SPF terminal on your desk. Salary range is \$25,000 to \$32,000 (dependent upon qualifications), with excellent benefits. In addition, you will enjoy all the conveniences of a small city and all of the cultural benefits of a university community.

If you are interested in this position, please send a resume to:

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## BOEING COMPUTER SERVICES

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## ELECTRONICS TECHNICIAN LOS ALAMOS NATIONAL LABORATORY

The Chemical Process Development Group at the Laboratory is seeking an Electronics Technician to provide computer/data acquisition system support to chemical process, laser isotope separation and laser development programs. This work requires a close working relationship with both experimentalists and software development personnel. Other job responsibilities include hardware configuration, design and set up, as well as diagnostic troubleshooting and repair of data acquisition hardware such as CAMAC modules, computer peripherals, follow and hold amplifiers and various computer interfaces.

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The Laboratory, one of the nation's leading multi-faceted research and development organizations, is operated by the University of California for the United States Department of Energy. We offer competitive salaries and a comprehensive benefits package, including 24 days of vacation a year. Our beautiful mountain location in northern New Mexico provides exceptional recreational activities and a casual, unpressured lifestyle.

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Sandy Harding  
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DIV. 85-H  
Los Alamos National Laboratory  
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### TECH SUPPORT - IMS Specialist

Candidate must have degree and experience in IMS/DC-DB environment. Skills should include performance and tuning of IMS data bases, DBD and PSB gens, physical and logical data base design and data dictionary usage.

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Background should include at least 4 years as an Analyst or Programmer/Analyst performing CICS on-line systems design and programming. OS/MVS operating experience is also required, with IMS/DB and BAL experience desirable.

These opportunities are accompanied by highly competitive salaries, comprehensive benefits, and on-going opportunities for career development with a company that has just celebrated its 50th anniversary.

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Manager, Employment & Compliance

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### DIRECTOR OF INFORMATION RESOURCES

The Virginia Department of Health is seeking an experienced data processing professional with in-depth knowledge of information technology, with emphasis on the use of Database Management Systems in a complex geographically distributed environment. Individual must have the ability to work effectively with the Information Policy Board and Health Department managers and executives statewide in determining needs for support, developing information system goals, capabilities and priorities, and operating the information system to meet those goals. Responsibilities include the management of the Division's business (Data Administration, Health Statistics, and Application Development and Operations) through middle managers to achieve information system goals. Proven skills and experience in developing, installing, and operating evolving complex information systems. Skilled in the use of analytical design, project management, and statistical tools in accomplishing organizational goals. Limited statewide travel. Salary: \$36,847-\$50,340 plus excellent benefits.

Closing date: 5:00pm, October 12, 1984. To insure proper consideration, specify announcement title and #4692 on form. Resumes may be attached. Forms are available at most local Virginia Employment Commission, Department of Health, and other State offices. If interested, submit a Virginia state application form to: Virginia Department of Health, Room 110, James Madison Building, 103 Governor Street, Richmond, VA 23219, (804) 786-3309.

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Excellent opportunity for an individual with two plus years of experience utilizing MVS, IMS and CICS. We offer a multi CPU environment with exceptional potential for advancement into management. All relocation fees paid by successful applicant. For personal consideration contact Kathy Parnell at (713) 792-4250 or submit resume in complete confidence to:

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**SYSTEMS ANALYST.** Design & analyze application systems for budgetary/Stock Control, Inventory Ledger/Accounts & Order Entry. 2 yrs exp nec or 2 yrs related exp at systems analysis. Must know C, OL, CICS, DBI, DMS, Filetab. Bachelors degree in Computer Science or Data Processing. \$30,000/yr to work 40 hrs/5 days/week. Please send resume to: KEANE, Inc., 22 Hudson Pl., Hoboken, NJ 07030.



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Please Submit resumes in confidence by November 1 to: Theresa Christensen, DSP Corporation, 10420 NE 37th Circle, Suite A, Kirkland, WA 98033.

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P.O. Box 17489  
Jacksonville, FL 32245-7489

## SYSTEMS ANALYST CAD/CAM/CAE

Hamilton Industries, Inc., has a major commitment to expand in the areas of CAD/CAM/CAE Information Systems. If you are an ambitious data processing professional with at least 2 years experience in CAD/CAM/CAE applications, we are interested in hearing from you. We have an immediate need for such a candidate in our Data Processing Department.

This position is primarily responsible for analyzing, designing, implementing and documenting new or revised business systems, working directly with our Contract Engineering and Product Development Engineering Department, and contributing to the integration of our existing CADAM and manufacturing systems.

Hamilton Industries, Inc., is a leading manufacturer of laboratory and hospital case work, and professional equipment and furniture. Two Rivers is located on the Lake Michigan shoreline a short distance from Door County. It is an ideal recreational area with much to offer a new professional in the community. Hamilton Industries offers an excellent compensation and benefit package, including dental insurance, educational assistance, profit sharing, an established wellness program, and relocation assistance. For immediate consideration, please send resume and salary history in confidence to: Manager, Employee Relations.

### HAMILTON INDUSTRIES

TWO RIVERS WISCONSIN 54241

An equal opportunity/affirmative action employer

JOIN THE LEADER  
**COMDISCO**

...and grow with us

Comdisco, Inc., the world's largest remanufacturer of IBM computers, has an exceptional opportunity for an innovative SYSTEMS ANALYST/PROJECT LEADER. Working in our dynamic Marketing department, you will provide the initiative for development of an automated marketing system in direct support of Comdisco's sales force.

The successful candidate will possess a Bachelor's degree; strong technical skills on mainframe and micros; a track record in analysis, functional design, and development; and significant experience in the automation of marketing systems.

In addition to high visibility and an opportunity to expand your career, we offer an extremely competitive salary coupled with superior benefits and an excellent work environment.

Qualified candidates should send a resume or letter outlining experience and salary history to:

DONNA AMADIO

**COMDISCO**

6400 Shafer Ct.

Rosemont, IL 60018

Equal Opportunity Employer M/F/H



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COMPUTER POWER  
GROUP PTY LTD

# HOGAN

## CONTRACTS IN AUSTRALIA

Computer Power Australia's leading banking software house require programmers, analysts and project leaders with experience in Hogan banking systems, especially in

**CICS/RPM  
DDA, TDA, Umbrella,  
Loans etc.**

Flexible start dates can be arranged, airfares plus visas are provided, plus interim accommodation. Come and see sunny Sydney with its beautiful harbour and bays.

Six to twelve months assignments. If you are interested in any of the above vacancies or require further details then call Computer Power on (214) 556-2930, or telex Australia AA70977 SEETAY, or send resume express mail to:

**Moray Robinson**  
**COMPUTER POWER**  
5215 North O'Connor  
2nd Floor  
Irving, Texas 75039

**DATA BASE ADMINISTRATOR**

## Join The Industry Leader

Vickers, Incorporated is a world leader in research, engineering and development of electrohydraulic, fluid power and mechanical transmission systems and components. Our MIS Department, featuring Sperry Univac 1100 systems and software, has a challenging growth opportunity for a Data Base Administrator.

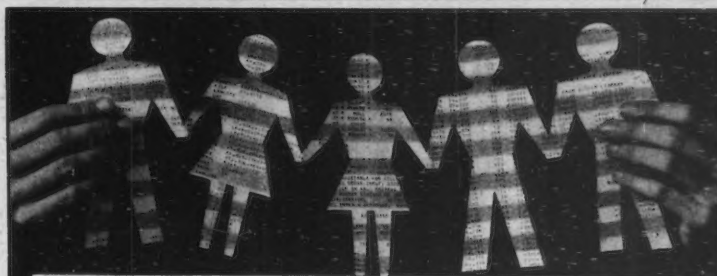
Reporting to the Division Systems Manager, you'll have responsibility for planning and coordinating the design and control of the company's data bases. You'll also assure the data base structure supports the information needs of Vickers. You will maintain the integrity and security of these data bases, and coordinate standardization of data codes across application and functional areas.

Requirements include a Bachelor's degree in Computer Science or Business Administration. Experience should include 4-6 years of computer systems design (preferably 2 years of systems design work using data base management systems); knowledge and understanding of data base concepts/principles; systems engineering tools such as systems logic, statistics and information flow; and experience with Sperry 1100 computer using DMS, TIP/CMS, DPS, and DRU highly preferred.

We offer an outstanding benefits program, a salary commensurate with experience, and advancement opportunity in our dynamic, industry-leading corporation. For confidential consideration, please forward your resume, including salary requirements, to: **Tommi Baker, Staffing Representative**

**VICKERS**

1401 Crooks Road • Troy, Michigan 48084  
Vickers, Incorporated • A Libbey-Owens-Ford Company  
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# SYSTEM DESIGN BEGINS AND ENDS WITH PEOPLE.

**YOU CAN CALL US NOW OR YOU CAN CALL US LATER.**

CompuSearch, a division of Management Recruiters, specializes in finding data processing people with the training and experience to step right into your DP staff positions and start producing —

right now.

Don't be frustrated by staff vacancies or expansion needs. Call CompuSearch today! We'll find, screen and deliver the qualified people you need.

[illegible]

# COMPU SEARCH

**SEARCH & SELECTION**  
A Division of Management Recruiters International

**Computer  
S/38 Programmer/Analyst**  
Washington, D.C. organization is seeking an energetic, experienced RPG-III/programmer. Position involves maintenance programming and development of programs in the coming year. We are involved in telecommunications, CP links to the Systems 38, as well as the typical maintenance programming of the Systems 38. The successful candidate must have a minimum of three years experience in RPG-III/programmer. The position involves working on a time interactive programs on an IBM Systems 38 and be willing to undertake a variety of tasks. We offer an excellent fringe benefits program, free parking. Qualified candidates must submit resumes, a description of the projects and programs for which you have been responsible, and salary requirements to:

Personnel Department  
Youth for Understanding  
3501 Newark Street, N.W.  
Washington, D.C. 20016  
EOE/AA

### Senior Programmer Analyst

Must be able to evaluate, design, generate, test and maintain applications software. Knowledge of COBOL, ASSEMBLER, CICS, OS/MVS, OS/JCL, VSAM essential. Must have three years on-line programming and analysis experience. Bachelors Degree in Computer Science or related field is preferred. Criminal justice experience a plus. Must be available November 1st, 1984. Send resume and salary requirements to

**Robert E. Lockwood,**  
Clerk Of The Court,  
201 S.E. Sixth Street, Rm. 230,  
Ft. Lauderdale, FL 33301

**Dunhill Means Experienced Systems Programmers, Analysts & Programmers**

## Programmers & Programmers

At Dunhill of Charlotte our only business is finding the right people for the job. We represent many of the largest and most respected corporations across the country. That's why we can offer the busy data processing professional the opportunity to explore the job market without doing any more than simply sending us a resume.

We are not asking you to make any commitment. There is never a fee for Charlotte, and all matters are held in strict confidence. DP area.

We are not just in Charlotte, and we will also be in the DP area with Dunhill and Charlotte, and we will also be in the DP area. What more could you ask for? We are also in the DP area. industry trends and current salary ranges in the DP area.

Keep your career running in high-gear by letting Dunhill of Charlotte find the opportunity you have been searching for as a professional. We want to go to work for you today. We specialize in the placement of experienced Programmers, Analysts and Systems Programmers in the Carolinas and throughout the beautiful Southeast and Southwest. Give us a call now, or send your resume to:

Keith Reichle, CPC  
Dunhill of Charlotte, Inc. Consultant

Keith Reichle, CPC  
Data Processing Consultant  
6401 CARMEL ROAD  
SUITE 107  
CHARLOTTE, NC 28226  
1-800-438-2012  
In North Carolina call collect (704) 542-0312

**Of Charlotte, Inc.**  
An Equal Opportunity Employer M/F



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## SPECIALIST COMPUTER APPLICATIONS

**OVERSEAS**

**Monthly Salary Range \$2785-4096 Tax Free\*  
Plus Free Housing**

Saudi Arabian Airlines, national flag carrier of the Kingdom of Saudi Arabia, is seeking qualified personnel for the position of Specialist Computer Applications.

**DUTIES**

Develop plans and specifications for the computerization of the planning functions performed by the Department of Planning and Research and other corporate divisions as well. Evaluate computer hardware and software needs of the P&R Division. Liaise with internal and external sources, as needed, with respect to P&R systems design, implementation and post evaluation. Conduct training in the use of application programs and serve as a resource for solving user problems.

**REQUIREMENTS**

College degree in computer science with 3-5 years related experience. Commercial airline/aircraft experience a plus.

**BENEFITS**

Free furnished air-conditioned housing and utilities • Paid medical and group life insurance • 30 day vacation-travel time to and from domicile • Free or reduced rates on Saudia and other airlines • Retirement program (social insurance after 15 years service) • Additional household shipment from domicile to Saudi Arabia and back • K-9 schooling for children — out of Kingdom financial assistance for other grades • Annual service increase and eligibility for yearly merit bonus based on performance.

\*Tax free status subject to normal qualifications. The indicated salary has been converted from Saudi Riyals to U.S. dollars at the current rates of exchange, which are subject to fluctuation. Position is offered on a two-year (renewable) contract. Send resume to:

**SAUDIA ARABIAN AIRLINES**  
Administrative Recruiter, Dept. C-AS  
2420 Pershing Road, Suite 333  
Kansas City, Mo. 64108

**saudia**  
SAUDIA ARABIAN AIRLINES

## SYSTEMS ANALYSTS

The geophysical center of one of America's leading energy concerns, located in Houston, Texas, is responsible for operating Control Data Corporation's CYBER 205 and 176 systems front ended by CYBER 750 and 855 systems to process seismic data in support of world-wide exploration. We are seeking NOS systems analysts to support the CYBER 750/855 systems as well as support geophysical research and some nonseismic related usage of computers.

Requirements include a degree in Computer Science or its equivalent and the following: 3 or more years experience in installation and maintenance of operating system software, resolution of system stability problems, and interaction with programming staff and users. Experience with the Network Host Products hardware and software is very desirable.

We offer an excellent salary and comprehensive benefit package which includes life, health and dental insurance, disability and retirement benefits as well as free parking and several transportation options. For confidential consideration, please send resume, including salary history to:

**SYSTEMS ANALYSTS**  
P.O. Box 271329  
Houston, Texas 77277

Principals Only!  
An Equal Opportunity Employer M/F

**Systems Analyst**

Design & implementation of computer systems for incorporation into other systems & data base designs, for communications industry and local area networks. Maintenance & enhancement of these systems. Provide vital skills which ensure their successful & cost effective operation. Utilize various types of Micro-Computers. Bachelor's degree in computer science or math. & 2 yrs. in job offered or 2 yrs. programming exp. req'd. Must have knowledge of Micro-Computers and C, ASSEMBLY 8086 & PASCAL. 4 hrs. per week, \$30,000 per year. Resume to: Bill Gates, Power Base Systems, 12 W. 37 St. NYC 10018

**SYSTEMS ANALYST.** Design & implementation of financial systems, utilizing data base systems. 4 yrs exp or 4 yrs related exp as programmer/analyst. Must know COBOL, DMS, TUC and ALGOL. \$2,750/mo. to work 40 hrs/5 days/week. Send resume: DATATRONICS, INC., 675 Third Avenue, NY, NY 10017.

**ASSOCIATE SYSTEMS PROGRAMMER**

Design, develop, implement testing procedure of X.25 Line Driver, using programmable protocol evaluation, POP 11/34 and POP 10. Documentation of message flow between Autonet network and attached X.25. Design and implement enhancements and new code. Must have BS Computer Science or Electrical Engineering plus 18 months experience. Must be familiar with communication concept in hardware and software; good software engineering skills; previous experience with communications protocols and experience in computer hardware. Must have special knowledge of computer networking for X.25. 40 hours per week, \$2,170 per month. Send resume: 1310 Woodward Avenue, Rm 415, Detroit, Michigan 47202. Ref. no. 35853.

**COMPUTER SCIENCE FACULTY POSITIONS EAST TENNESSEE STATE UNIVERSITY**

Tenure-track faculty positions in the Department of Computer and Information Sciences. Duties include teaching broad range of undergraduate courses, research, and professional service. Rank and salary depend upon qualifications. Ph.D. in Computer Science or Information Science preferred. M.S. with experience will be considered. Send vita and references to Personnel Office, ETSU, Johnson City, TN 37614. Position is available August 15, 1985. Review of applications will begin immediately and continue until position is filled. Equal Opportunity/Affirmative Action Employer.

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No other publication carries as many ads for computer professionals as Computerworld, so no other publication can give you as wide a choice of jobs, salary and location as Computerworld.

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Be sure you look over our recruitment ads every week, so you don't miss the opportunity that's just right for you.

## EDP AUDITING

**Add an Extra Measure of Potential to Your Career**

Perhaps it's the additional responsibility, or a sense of newly found freedom. Maybe it's the opportunity to handle every aspect of the EDP Auditing function.

For these reasons, and others, the position we seek to fill offers a genuine challenge that will both broaden and advance your professional career. This key position, reporting directly to the Corporate EDP Audit Manager, will require at least 2 years' experience in a progressively responsible role in EDP auditing. In order to reap the rewards and meet the demands of this highly visible position, your background should exhibit an excellent academic record. A B.S. or B.A. is required. Prior experience with a sophisticated manufacturing operation is a definite plus.

AVCO Corporation is a prestigious and quality-oriented company, diversified in four select business areas: financial services, population systems, aerospace technology and management services. We offer a competitive salary and comprehensive benefits package. This position, based at our Greenwich, CT headquarters will involve approximately 40% travel.

For prompt confidential consideration, please forward your resume with salary history to:

Employee Relations Dept. E

**AVCO Corporation**  
1275 King Street  
Greenwich, CT 06830  
An Equal Opportunity Employer

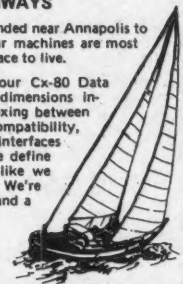
**AVCO**

## System Developers CRUISE THE CHESAPEAKE BAY NOT THE HIGHWAYS

Five years ago, COMMTEx was founded near Annapolis to build data networking products. Our machines are most successful and Annapolis is a great place to live.

Now the challenge is to expand our Cx-80 Data Exchange product line in several dimensions including: Integration of T1 multiplexing between nodes, enhancing our SNA compatibility, extension of our X.25 packet interfaces and IEEE 802 ports. Join us as we define excellence in these technologies - like we did in 3270 protocol conversion. We're still small enough for it to be fun and a key-man equity plan is available.

**COMMTEx INC.**  
2411 Crofton Lane  
Crofton, MD 21114  
E.O.E. (301) 721-9666



## System Developers 800-231-5920

Inviting resumes from individuals in the more highly technical computer related vocations such as: PhD Computer Scientists, Operating System Developers, Data Base Developers, Porting Specialists, Networks and Telecommunications, Architecture, Artificial Intelligence, Graphics Systems Developers, Microcoders and Firmware Developers, Compiler Development, etc. Special interest in emerging technology such as novel architecture, UNIX, ADA, etc. Similar interest in scientific applications developers including military, process control, data acquisition, telemetry and communications, CAD/CAM, simulation and modeling, etc.—we are a professional employment firm managed by graduate engineers. Fees are paid by the employer. All geographic locations. Send resume or call D.A. Redwine and ask for our free resume workbook & career planner.



**Scientific Placement, Inc.**  
P.O. Box 19948 CW Houston, TX 77224 713/496-6100  
UNIX is a trademark of Bell Labs

**PROGRAMMER**

## SYSTEMS PROGRAMMER

GIVAUDAN, a major fragrance, flavor and chemical company, is currently seeking an experienced Systems Programmer.

This exciting opportunity offers personal satisfaction and professional growth as we convert to State-Of-The-Art software and hardware.

Responsibilities encompass all phases of systems programming, including full exposure to all systems software, maintenance of company Disaster Plan and interfacing with both applications programmers and systems users.

Successful candidates should possess an AA in Computer Science with at least 3 years systems level programming experience in CICS under IBM DOS/VSE and VM/370 environment. Knowledge of COBOL and Assembler are also required.

We offer an excellent starting salary and comprehensive benefits package. For immediate consideration, please forward resume, (which MUST include current salary requirements), to: J.L. SONDAK.



**GIVAUDAN CORP.**  
100 DELAWANNA AVE.  
CLIFTON, NJ 07015-5034  
Equal Opportunity Employer M/F

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## LIVE AND WORK WHERE MOST PEOPLE PLAY

### Foreign Service Premium Pay, Single Status Openings With RCA On Andros Island, Bahamas

The RCA Service Company is the maintenance and operation contractor to the U.S. Navy's Atlantic Undersea Test and Evaluation Center (AUTEC). The immediate openings currently exist on Andros Island, Bahamas (35 miles west of Nassau). We invite you to examine the following:

#### Computer Programmer

We seek a Systems Programmer for real-time and post-test interrupt acoustic data acquisition and processing system. Hardware consists of 16 bit word CDC 1700 computer, Data General Eclipse 5-200 mainframe, Auxiliary Chromatics Computers, 1 VAX 11/750 and 1 VAX 11/780 computers. Requirements include a B.S. Degree in Mathematics, Computer Science, or Engineering, and at least 3 years previous experience.

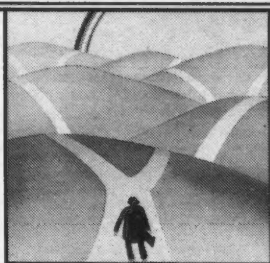
#### Systems Service Engineer

Individual will perform diagnostic and systems performance tests and maintenance on digital and analog electronic equipment on Acoustics Range. Requirements will include 4 years experience of electronic systems maintenance.

All positions offer base salary plus foreign service premiums, free lodging and free meals (sorry, no family accommodations; only single status will be considered). If you feel your background meets the above requirements, please forward a current resume with salary history to:

Manager of Employment  
RCA Service Company  
AUTEC Project, Dept. 261958  
3800 Southern Blvd.  
West Palm Beach, FL 33402

Equal Opportunity Employer



## The Power Of The Right Decision™

Making the right decision in your career gives you a powerful advantage. The right decision provides a path for future growth and professional development. The right decision will involve you in state-of-the-art technology. The right decision will allow you to make a significant contribution. The right decision will offer new development challenges. One such powerful decision is a career with American Software, Inc.

For 14 years now, American Software has been perfecting cross-industry management software packages—for manufacturing, for distribution, and for financial operations. These COBOL software products support the leading database and teleprocessing technologies—CICS, DL-1, IMS DB/DC, IDMS, ADABAS, DATACOM-DB, and IBM System/38.

Because of continuing growth, we are seeking *Software Systems Consultants* (programmers and programmer analysts) and *Project Leaders* with solid experience in any of the above technologies. Additional opportunities are available for *Software Account Managers* and *Product Consultants* experienced in manufacturing, purchasing, and materials management. These opportunities are at our main headquarters in Atlanta, Georgia—a dynamic city selected as one of the top ten places to live in the United States.

Investigate this opportunity to make the right decision. Call collect or write the Director of Human Resources.



443 East Paces Ferry Rd., Atlanta, GA 30305 (404) 261-4381.

E.O.E.

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M/E/R/H/O/V

#### Electronics

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Federal Express has an opportunity for you to work with our absolutely, positively, incredible technology. The pioneer leader in overnight delivery of high priority business goods and documents is taking the next logical step...announcing ZapMail, the two hour electronic express service. Rapid growth of our Electronic Products Division has created the need for the following individuals:

### SENIOR MANAGER NETWORK SUPPORT

As the Senior Manager of Network Support for ZapMail, you'll monitor, maintain and operate unique communications facilities for the ZapMail Network. You'll manage a large staff of professional and technical support personnel coordinating the installation, maintenance, and repair of communications equipment as well as managing circuit administration, node installation, and network analysis. To qualify for this position, you'll need a Bachelor's Degree or the equivalent in Electronic or Electrical Engineering together with a minimum of eight years professional experience in telecommunications, systems maintenance, repair and diagnostic evaluation. Five years previous management experience encompassing high technology communications analysis, operations and control is preferred. Experience in managing a large staff is preferred. Your letter or resume should indicate your in-depth telecommunications systems experience and demonstrated skills to manage a large dynamic communications monitoring network.

### MANAGER OF NETWORK OPERATIONS

Our Network Control Operations Center provides uninterrupted system availability and technical assistance to users of our

packet switched communications network. Your staff will include Datacommunications and Telecommunications Specialists. This position requires technical knowhow, but more importantly requires someone with the ability to handle people in a high tech environment. The successful candidate will have a minimum of a Bachelor's Degree in Computer Science or Electrical Engineering, six years experience in Datacommunications hardware and software systems with experience preferred in Network Operations or Technical Control with strong planning skills. Previous management of a large staff is preferred.

### TECHNICAL ADVISOR

The Electronic Products Division of Federal Express is currently seeking a Technical Advisor who will be responsible for conceiving, defining, and developing technical specifications and operational procedures for new electronic communication products and services, assessing state-of-the-art technologies and coordinating new product specifications with Federal Express technology specialists and external hardware/software vendors.

The successful candidate will have a Bachelor's Degree in Electrical or Electronic Engineering, Math, Physics or Computer Science, 7 years professional experience in technical development of electronic information products and services; MBA, project management and international experience preferred.

These are opportunities for you to work in a company with high recognition, unparalleled growth, high incentives, and extensive and unique benefits...a company on the leading edge of high technology. Relocation will be available at our expense to Memphis, Tennessee.

For prompt consideration please rush a letter indicating your experience and salary history.

TO EXPEDITE CONSIDERATION, PLEASE CLEARLY INDICATE THE POSITION YOU ARE INTERESTED IN ON YOUR REPLY ENVELOPE.



FEDERAL EXPRESS  
CORPORATION  
Electronic Products Division-Personnel  
P.O. Box 727, Dept. 3514-412  
Memphis, TN 38194

Equal Opportunity Employer M/F

### DATA PROCESSING PLANNING ADMINISTRATOR:

Will coordinate the development of strategic and medium-range plans related to the implementation of a Hospital Information System. Reporting to the Director of the Information Services Division, the Planning Administrator will be responsible for the creation and continuing evaluation of strategic system planning, assessment of budgetary impact, and formulation of policy related to Departmental, Division Support, Communications, and Office Automation systems. Position requires knowledge of the health care industry and demonstrated success in a responsible position of a Data Processing Department. Requires graduation from an accredited college or university and a minimum of four years experience. Graduate degree and/or experience in a university teaching hospital preferred. Salary open. Interested candidates should send a current resume to:

Richard L. Teelockhorst  
Director, Information Services  
North Carolina Memorial Hospital  
8th Floor, Patient Support Tower  
Chapel Hill, North Carolina 27514

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### UNIVERSITY OF PUGET SOUND Tacoma, Washington

Tenure-track faculty position; to begin 9/85. Rank and salary commensurate with experience; excellent benefits. Teach upper division computer science classes together with introductory computer science courses. Ph.D. in Computer Science or one of the mathematical sciences and a genuine interest in teaching required. Facilities for academic computing include a VAX, a PDP 11/24, 5 LSI 11 micros and a SAGE IV microcomputer. APPLICATION DEADLINE: 11/16/84. Send complete dossier to: Computer Science Search, University of Puget Sound, P.O. Box 7297, Tacoma, WA 98407. An Equal Opportunity, Affirmative Action Employer/Employee.

## First National Bank in Albuquerque APPLICATIONS PROGRAMMERS

The Information Systems department of The First National Bank in Albuquerque has excellent opportunities for applications programmers. We are an MVS/JES2 installation running a statewide ATM network and actively engaged in creating the banking environment of the future. Our development environment is based on two 4341-2 computers using TSO/ISPF.

The applications programmers will become involved in the development and maintenance of batch application systems. We are seeking professionals with a minimum of an appropriate degree and/or three years of experience in banking applications, as well as experience in IBM/370 ASSEMBLER, COBOL, MVS JCL AND Utilities, and VSAM.

First National Bank offers an excellent compensation and benefits package. Qualified applicants should submit resume and salary history to:

Employee Relations Manager  
FIRST NATIONAL BANK  
IN ALBUQUERQUE  
P.O. Box 1305  
Albuquerque, NM 87103

This position is for non-agency applications only.

We are an equal opportunity employer m/f/h



The First National Bank  
in Albuquerque



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## CORPORATE INFORMATION SYSTEMS

Ford Aerospace Corporate Information Systems

### CURRENT OPPORTUNITIES

Viability. Responsibility. Accountability. You'll experience it all at Ford Aerospace in Irvine. As an integral member of the expanding Corporate Information Systems Activity, you'll be tasked with developing the Business Information Systems that support the Financial, Accounting and Industrial Relations operations for all of Ford Aerospace and Communications Corporation. Opportunities are currently available for qualified candidates in the following areas:

### DATABASE ADMINISTRATOR

We are looking for an individual who can coordinate the implementation of our new Financial, Accounting and Human Resource databases. You will have design responsibilities for all logical and physical databases. You will need to possess proven skills in both logical and physical database design, as well as a strong background in applications development. A thorough knowledge of database theory is required. Knowledge of DBMS (or other CODASYL compliant DBMS) is required. IDB, ADSO, DBMS-DC and MVS/TSO is a plus.

### DATABASE ANALYST

Looking for a challenge? You will design, implement, monitor and tune production databases to support new Financial, Accounting, and Human Resource Systems. Working as a member of one of several project teams, you will interface directly with programming staff and users to develop logical database designs, schemas and subschemas, control database access and security, and monitor database performance. Your qualifications should include a good understanding of database theory and techniques as well as experience in database design in an IDB or other CODASYL DBMS environment. A background in business systems programming is a plus.

### INFORMATION CENTER SPECIALIST

Provide on-call technical support for resolution of user questions and problems associated with IBM mainframe, IBM PC, and fourth generation language software. Responsible for conducting user training as well as preparing training materials and user guides. Experience with JCL, IFPS, FOCUS, SP, TELL-A-GRAF, LOTUS 1-2-3, and Multimate a plus with a BS degree preferred.

### BUSINESS PROGRAMMER/ANALYST

Organizational growth requires that we add several professionals to our programming staff. You will participate in the development of new on-line systems for Personnel, Payroll, Finance and Accounting. You will have the opportunity to be involved in developing user requirements, Analysis, Design, Coding and the implementation of these various business systems on a large IBM mainframe using COBOL, DBMS-DC/DC and Fourth generation languages. Three to four years experience as a programmer/analyst developing business systems in a large scale IBM environment required.

To investigate the creative freedoms and tangible opportunities for professional growth that a career at Ford Aerospace can offer, please send your resume in strict confidence to: Nancy Palmer, Professional Placement, Dept. A762-504, 2801 Kelvin Avenue, Irvine, CA 92714



**Ford Aerospace & Communications Corp.**  
DIVAD Division

An Equal Opportunity Employer M/F/H. U.S. Citizenship Required.

### MIDWEST SR. PROGRAMMER/ANALYST

Material handling company is seeking several individuals to join industrial/process control software team. D.E.C. R.S.X. and V.A.X. Fortran and/or Pascal Degree in computer science or equivalent. At least 2 years in design/programming of integrated systems. Communication skills required. Send resume to:

**CONCO-TELLUS INC.**  
SOUTH 14th AVE.  
MENDOTA, IL 61342  
Equal Opportunity Employer

### COMPUTER PROGRAMMER

One Research Engineer position for Structural Engineers with FORTRAN programming experience. The position requires an MS in civil engineering or another field with an emphasis in structures. The position offers exceptional opportunities to develop large scale civil engineering software for worldwide distribution. Salary is commensurate with experience. Send resume, references, current salary and availability information to:

**Dr. Kenneth Will,**  
GTCS Systems Laboratory,  
School of Civil Engineering,  
Georgia Institute of Technology,  
Atlanta, GA 30332.  
Georgia Tech is an Equal Opportunity and Employment Opportunity Institution.

### DATA BASE ANALYST TO HIGH \$30's

2 years of DBA experience with IMS will qualify you for this highly visible position. Work with application teams in developing a new Corporate Database. Experience with Data Dictionary and degree are strong pluses. Call Mark David or Tim Smith at (612) 339-9001 on Job # 6281.

**ROBERT HALF**  
OF MINNEAPOLIS, INC.  
3636 IDS Center  
Minneapolis, MN 55402

## HIRING?

More computer people read Computerworld than any other newspaper in the United States - more than half a million computer people every week.

And, among our 529,650 readers at user organizations, about half claim to look at recruitment ads at least every other week (only a small percentage say they never look at recruitment ads).

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Framingham, MA 01701  
1-800-343-6474  
617-879-0700

SYSOREX INTERNATIONAL, a California corporation and a growing systems management company has the following challenging positions open in Washington, D.C.

## SENIOR APPLICATION ANALYST/PROGRAMMER

Four to eight years working background with 2-3 years in accounting, and manufacturing systems and experience in business applications analysis/auditing. Skilled in implementing structural system analysis and design projects, including fluency in using tools such as data flow diagrams, logical data analysis, etc. Programming experience with IBM DOS/VS/COBOL/JCL, on-line systems (CICS, IDMS-DC OR COMPLETE), database systems (IMS, IDMS, or ADABAS). Good written/oral communications skills. Willing to travel and work in team environment.

## DATABASE ADMINISTRATOR

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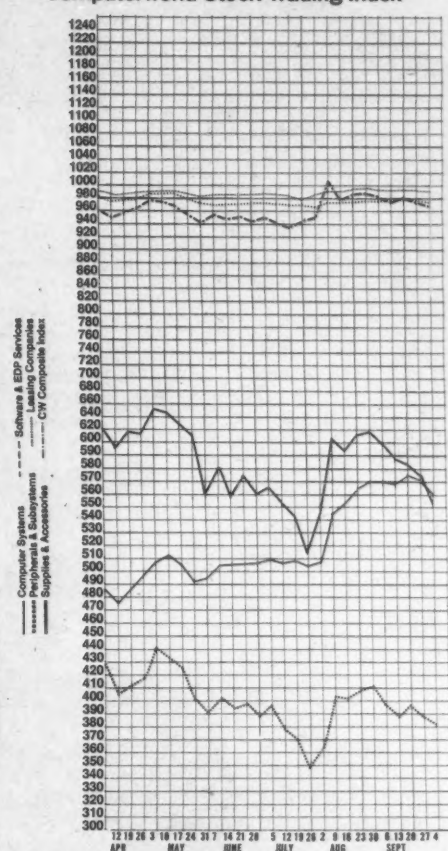
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## Computerworld Stock Trading Index



## Computerworld Stock Trading Summary

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## TRADE QUOTES

CLOSING PRICES WEDNESDAY, OCTOBER 3, 1984

					PRICE										PRICE														
					1983-84					1984					1983-84														
					CLOSING					CLOSING					CLOSING														
					OCT 3					OCT 3					OCT 3														
					1984					1984					1984														
					CHANGE					CHANGE					CHANGE														
COMPUTER SYSTEMS										SOFTWARE & ERP SERVICES																			
O ALPHA MICROSYSTEMS	8-24	8	-1/8	-1.5	D ADVANCED TECH	3-8	3	-1/4	-1.8	N COMMUNICORP	28-40	32 3/4	-2	-8.5	D ADVANCED MICRO DEV	25-41	34 1/2	-1 1/4	-5.4										
O ALTOS COMPUTER SYST	8-21	8 5/8	0	-1/2	N ADVANCED SYSTEMS INC	18-22	18 1/2	+1/4	+1.5	D COMPUTER TRANSCORP	5-10	10 3/8	-1	-7.1	D ALTOS COMPUTER SYST	8-21	8 5/8	-1/2	-4.4										
A ARABAQ CORP	10-30	12 7/8	0	+1/8	D ASX COMPUTERS INC	11-32	11 1/2	0	+8.5	N COMCON CORP	28-34	28 1/2	-1/4	-6.1	A ARABAQ CORP	10-30	12 7/8	0	+1/8										
D APPLE COMPUTER INC	18-63	25 1/8	0	-3/8	D AUTOMATIC DATA PROC	30-44	38	0	+0.8	N COMCORP	28-34	28 1/2	-1/4	-6.1	D APPLE COMPUTER INC	18-63	25 1/8	0	-3/8										
N AT&T	10-20	12 7/8	0	+1/8	N ANACORP INC	2-18	2 3/8	-1/8	-5.5	D DATA PRODUCTS CORP	18-32	18 3/8	-7/8	-22.4	N AT&T	10-20	12 7/8	0	+1/8										
D BURROUGHS CORP	44-58	51 1/8	0	-3/8	D ANALYTICS INTL CORP	3-17	3	0	+13.0	D DATA SWITCH CORP	8-41	8	0	0	D BURROUGHS CORP	44-58	51 1/8	0	-3/8										
D COMPAC COMPUTER CP	4-13	3 3/4	0	-1/2	D AMBITON FATE	18-37	24 3/8	-1/4	-1.0	D DECISION DATA COMPUT	1-17	4 7/8	-3/4	-13.3	D COMPAC COMPUTER CP	4-13	3 3/4	0	-1/2										
D COMPUTER AUTOMATION	5-17	5 3/8	0	0	D ASR COMPUTER SYSTEMS	12-21	15	0	-6.2	D DIGITAL DATA CORP	16-18	11 5/8	-1	-7.0	D COMPUTER AUTOMATION	5-17	5 3/8	0	0										
D CONQUEST CORP	25-62	28 1/2	0	+1/8	D ASTRA COMPUTER INC	30-44	38	-2 3/8	-1.1	D ELECTROL-SILVET	8-18	4 1/2	-1	-10.0	D CONQUEST CORP	25-62	28 1/2	0	+1/8										
N CONTROL DATA CORP	25-62	28 1/2	0	+1/8	N AUTOMATIC DATA PROC	30-44	38	0	+4.7	N ELECTRONIC & R	5-11	7 3/8	-1/4	-3.2	N CONTROL DATA CORP	25-62	28 1/2	0	+1/8										
D CONVERGENT CORP	10-13	13 1/4	0	-1/8	D COA COMPUTER ASSOC	8-17	12 3/8	-1/8	-1.0	D EVANS & HATHORN	13-30	18 3/4	-3 1/4	-14.7	D CONVERGENT CORP	10-13	13 1/4	0	-1/8										
N CRAY RESEARCH INC	38-58	48 1/4	0	-2 7/8	D COMPUTER ASSOC INTL	12-20	18 1/4	-1/4	-1.5	D GARY, INC	8-14	13 3/4	-1/4	+3.2	N CRAY RESEARCH INC	38-58	48 1/4	0	-2 7/8										
D DAILEY SYSTEMS INC	27-48	48 1/2	0	-1 1/2	D COMPUTER HORIZONS	8-20	9	0	-1/4	D GENTL'S DATA CORP	10-10	10 3/8	-1 1/8	-5.9	D DAILEY SYSTEMS INC	27-48	48 1/2	0	-1 1/2										
N DATA GENERAL CORP	27-48	48 1/2	0	-1 1/2	D COMPUTER NETWORKS	11-23	16 3/8	0	-5.1	D GENTL'S DATA CORP	10-10	10 3/8	-1 1/8	-5.9	N DATA GENERAL CORP	27-48	48 1/2	0	-1 1/2										
N DATAPoint CORP	14-31	14	0	+1/8	D COMPUTER TALK GROUP	8-18	8 3/4	0	-1/2	D GENTL'S DATA CORP	10-10	10 3/8	-1 1/8	-5.9	N DATAPoint CORP	14-31	14	0	+1/8										
N DIGITAL EQUIPMENT	64-125	125 3/8	0	-1 1/2	D COMPUTONE SYSTEMS	4-23	9 3/8	-1 1/8	-18.4	D GENTL'S DATA CORP	10-10	10 3/8	-1 1/8	-5.9	N DIGITAL EQUIPMENT	64-125	125 3/8	0	-1 1/2										
A DEC CO	12-18	13 3/8	0	-1/2	D CONSERV CORP	1-18	3 1/4	-3/8	-19.3	D INFORMATION INTL INC	3-8	3 1/2	-1/4	-3.4	A DEC CO	12-18	13 3/8	0	-1/2										
N ELECTRONIC ASSOC	12-44	15 1/8	0	-2 5/8	D CORNAME	7-14	8 1/4	0	+1/4	D INTERCOM INC	7-21	11 1/8	-3/8	-3.2	N ELECTRONIC ASSOC	12-44	15 1/8	0	-2 5/8										
N FLOATING POINT SYST	28-47	37 3/8	0	-2 1/4	D CYCARE SYSTEMS INC	18-25	25	0	+1/2	D INTEL CORP	27-45	28	-1 3/4	-5.8	N FLOATING POINT SYST	28-47	37 3/8	0	-2 1/4										
N FORSDYKE	28-47	37 3/8	0	-2 1/4	D ELECTRONIC DATA SYST	25-46	46 1/4	0	+1/4	A LUNDY ELECTRONICS	7-18	8 7/8	0	0	N FORSDYKE	28-47	37 3/8	0	-2 1/4										
D GENERAL AUTOMATION	7-16	8	0	0	D HODAN SYSTEM INC	10-27	11 1/2	-1/2	-4.1	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	D GENERAL AUTOMATION	7-16	8	0	0										
N GOLD INC	24-44	25	0	0	D INFORMATION GENERAL	15-17	16 1/4	0	-1/8	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N GOLD INC	24-44	25	0	0										
N HARRIS CORP	23-40	25 1/4	0	-1 1/8	D INFORMATION SCIENCE	5-17	8 3/4	0	0	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N HARRIS CORP	23-40	25 1/4	0	-1 1/8										
N HEMLETT-PACARD CO	31-48	35 3/4	0	-2 3/8	D INFOTRON SYSTEMS CP	24-25	24 1/2	0	-1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N HEMLETT-PACARD CO	31-48	35 3/4	0	-2 3/8										
N HONEYWELL INC	48-58	57 1/2	0	-1 1/2	D KEANE ASSOCIATES	8-12	12	0	0	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N HONEYWELL INC	48-58	57 1/2	0	-1 1/2										
N IBM	103-134	121 1/4	0	-3 3/8	D LECORP	18-31	28 7/8	-1 1/2	-6.0	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N IBM	103-134	121 1/4	0	-3 3/8										
D JAL SYSTEMS INC	3-14	4	0	-1/4	D LOGIC DEVELOPMENT CP	51-53	51 1/2	0	-1/4	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	D JAL SYSTEMS INC	3-14	4	0	-1/4										
N JTI CORP	21-67	28 1/4	0	-1 1/8	D MCI COMMUNICATIONS	8-28	7 1/4	0	+1/4	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N JTI CORP	21-67	28 1/4	0	-1 1/8										
N KVA-COM INC	13-29	15 3/8	0	-1 1/2	D MINT SCI CORP INC	31-33	31 1/2	0	-1/4	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N KVA-COM INC	13-29	15 3/8	0	-1 1/2										
D MANAGEMENT ASSIST	8-28	25 1/2	0	-1 1/2	D MATHEMATICAL APP GRP	8-18	7 1/4	0	+3/4	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	D MANAGEMENT ASSIST	8-28	25 1/2	0	-1 1/2										
N MATSUSHITA ELECTRIC	60-88	87 1/4	0	-2 3/8	D MICRO SYSTEMS INC	8-14	11 1/4	0	-1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N MATSUSHITA ELECTRIC	60-88	87 1/4	0	-2 3/8										
N MODULAR COMPUTER SYS	8-18	8 3/4	0	-1/2	D MICROPRO INT'L CP	3-10	2 3/4	-1/2	-15.3	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N MODULAR COMPUTER SYS	8-18	8 3/4	0	-1/2										
N NODINE DATA SCI	8-17	14	0	+3/4	D MICHIGAN-HESPER CP	12-18	13	0	-1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N NODINE DATA SCI	8-17	14	0	+3/4										
N MOTOROLA INC	29-48	38 1/4	0	-1 1/8	D NATIONAL DATA CORP	8-28	9 3/8	-1 1/2	-1.3	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N MOTOROLA INC	29-48	38 1/4	0	-1 1/8										
N NAT'L BENCHMARKING	11-20	12 1/2	0	-1/4	D ON-LINE SOFTWARE INT	7-28	7	0	+1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N NAT'L BENCHMARKING	11-20	12 1/2	0	-1/4										
N NBI INC	10-26	18 1/4	0	-1 1/2	D PARADIGM SYSTEMS	20-22	21 1/2	0	+1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N NBI INC	10-26	18 1/4	0	-1 1/2										
N NCR	21-28	23 3/4	0	-1 1/2	N PLANNING RESEARCH	12-21	12 3/4	0	+1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N NCR	21-28	23 3/4	0	-1 1/2										
N PERKINS-ELMER	18-27	21 3/4	0	-1 1/2	D POLAR POINT SYSTEMS CP	25-27	27	0	-1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N PERKINS-ELMER	18-27	21 3/4	0	-1 1/2										
N PRIME COMPUTER INC	11-26	18 3/4	0	-1 1/2	D PROGRAMMING & SYS	4-8	4 3/4	0	-1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N PRIME COMPUTER INC	11-26	18 3/4	0	-1 1/2										
N SENTRY CORP	25-38	34 1/4	0	-1 1/2	D REVOLUTIONARY METHODS	28-31	30	0	-1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N SENTRY CORP	25-38	34 1/4	0	-1 1/2										
D STRATUS COMPUTER INC	8-17	8 1/2	0	-1/4	D BEI CORP	10-14	10 1/4	-1/2	-4.4	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	D STRATUS COMPUTER INC	8-17	8 1/2	0	-1/4										
G TANDER COMPUTERS INC	15-40	15	0	-1 1/2	D SHARED MEDICAL SYST	23-42	27 7/8	0	+1 1/4	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	G TANDER COMPUTERS INC	15-40	15	0	-1 1/2										
D TANDY CORP	22-40	38 1/4	0	-1 1/2	D SCIENTIFIC COMPUTERS	8-15	13 1/4	0	-1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	D TANDY CORP	22-40	38 1/4	0	-1 1/2										
O TELEVIDEO SYSTEMS	4-41	13 3/4	0	-3/8	D SOFTWARE INC	10-18	13	0	-1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	O TELEVIDEO SYSTEMS	4-41	13 3/4	0	-3/8										
D TELCOR INC	29-48	38 1/4	0	-1 1/8	N UNICORP	12-18	13 1/4	0	-1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	D TELCOR INC	29-48	38 1/4	0	-1 1/8										
N TEXAS INSTRUMENTS	101-108	124	0	-3/4	N UNICEL	7-17	10 3/8	0	-1 1/2	N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N TEXAS INSTRUMENTS	101-108	124	0	-3/4										
N ULTIMATE CORP	10-18	18 3/4	0	-1 1/2						N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N ULTIMATE CORP	10-18	18 3/4	0	-1 1/2										
D VECTOR GRAPHICS INC	0-4	0	0	-1/4						N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	D VECTOR GRAPHICS INC	0-4	0	0	-1/4										
N VANGUARD CORP	24-42	25 3/4	0	-1 1/2						N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N VANGUARD CORP	24-42	25 3/4	0	-1 1/2										
A VANGUARD LABS "C"	24-42	25 3/4	0	-1 1/2						N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	A VANGUARD LABS "C"	24-42	25 3/4	0	-1 1/2										
N VISION CORP	28-32	37 1/2	0	+1/4						N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N VISION CORP	28-32	37 1/2	0	+1/4										
N VISION CORP	28-32	37 1/2	0	+1/4						N MESA CORP	2-12	11 1/2	-1 1/2	-11.5	N VISION CORP	28-32	37 1/2	0	+1/4										
LEASING COMPANIES										PERIPHERALS & SUBSYSTEMS										SUPPLIES & ACCESSORIES									
O BOOTHE FINANCIAL CP	10-22	20 1/2	0	-3/4	-3.5	P AR INTERNATIONAL	2-7	7 3/4	0	+1/2	+8.1	N AMERICAN BUS PROG	23-23	23 5/8	0	-1/2	-2.1	O BOOTHE FINANCIAL CP	10-22	20 1/2	0	-3/4	-3.5						
A CRI CORP	4-10	8	0	-1/2	-8.8	D ANDERSON JACOBSON	8-26	5 1/8	0	-1/2	-6.2	N SAMSUNG	23-23	23 5/8	0	-1/2	-0.5	A CRI CORP	4-10	8	0	-1/2	-8.8						
D COMSIS INC	10-62	11 1/4	0	-1 1/2	-9.1	D AUTO-IDEAL TECHNOLOGY	10-20	20 3/4	0	-1 1/2	-1.1	N SAMSUNG	23-23	23 5/8	0	-1/2	-0.5	D COMSIS INC	10-62	11 1/4	0	-1 1/2	-9.1						
O CONFIDENTIAL INFO SYS	5-18	18 3/8	0	-3/8	-9.5	O AVANT-GARDE COMPUTING	15-20	20 1/4	0	-3/4	-3.6	N SAMSUNG	23-23	23 5/8	0	-1/2	-0.5	O CONFIDENTIAL INFO SYS	5-18	18 3/8	0	-3/8	-9.5						
N DFF INC	10-18	13 3/4	0	-1 1/2	-9.6	D BRACIFIC INC	5-10	8 1/4	0	0	0	N SAMSUNG	23-23	23 5/8	0	-1/2	-0.5	N DFF INC	10-18	13 3/4	0	-1 1/2	-9.6						
O FIDELITY AMERICAN INC	8-17	7 1/4	0	+1/4	-9.8	N BENTLEY INT'L	3-10	3 1/4	0	-1/2	-4.4	N SAMSUNG	23-23	23 5/8	0	-1/2	-0.5	O FIDELITY AMERICAN INC	8-17	7 1/4	0	+1/4	-9.8						
O GELATION INC	11-14	14	0	-1 1/2	-10.0	N BOLT-BERNESE & NEW	17-20	19 3/4	0	-1 1/4	-1.4	N SAMSUNG	23-23	23 5/8	0	-1/2	-0.5	O GELATION INC	11-14	14	0	-1 1/2	-10.0						
N U.S. LEASING	28-44	35 3/4	0	-1 1/8	-10.0	O CANEX CORP	5-10	10 3/8	0	-1 1/2	-2.8	N SAMSUNG	23-23	23 5/8	0	-1/2	-0.5	N U.S. LEASING	28-44	35 3/4	0	-1 1/8	-10.0						
						A CEEC CORP	12-18	13 1/4	0	-1 1/2	-6.3	N SAMSUNG	23-23	23 5/8	0	-1/2	-0.5												
						A COMINTECH	4-20	4 3/8	0	0	0	N SAMSUNG	23-23	23 5/8	0	-1/2	-0.5												
COMPONENTS										PERIPHERALS & SUBSYSTEMS										SUPPLIES & ACCESSORIES									
N ADVANCED MICRO DEV	25-41	34 1/2	0	-1 1/4	-5.4	D ANDERSON JACOBSON	8-26	5 1/8	0	-1/2	-6.2	N AMERICAN BUS PROG	23-23	23 5/8	0	-1/2	-2.1	N ADVANCED MICRO DEV	25-41	34 1/2	0	-1 1/4	-5.4						
D ADI'S ELECTRONIC	18-38	18 1/4	0	-1 1/4	-6.7	D AUTO-IDEAL TECHNOLOGY	10-20	20 3/4	0	-1 1/2	-1.1	N SAMSUNG	23-23	23 5/8	0	-1/2	-0.5	D ADI'S ELECTRONIC	18-38	18 1/4	0	-1 1/4	-6.7						
N ANALOG DEVICES INC	20-32	21 1/2	0	-3/4	-14.9	O AVANT-GARDE COMPUTING	15-20	20 1/4	0	-3/4	-3.6	N SAMSUNG																	

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